CRITICAL AREAS REPORT & CONCEPTUAL MITIGATION PLAN HYLA CROSSING PUMPED STORMWATER DISCHARGE PROJECT ISSAQUAH, WASHINGTON

Prepared For: KPFF CONSULTING ENGINEERS Seattle, Washington

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Critical Areas Report & Conceptual Mitigation Plan Hyla Crossing Pumped Stormwater Discharge Project Issaquah, Washington

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EXECUTIVE SUMMARY

PROJECT NAME: Hyla Crossing Pumped Stormwater Discharge Project CLIENT: KPFF Consulting Engineers, c/o Martin Chase, PE

SITE LOCATION: The Project Area includes parcels north and south of Interstate 90 in the City of

Issaquah, including the Greenwood Trust Sammamish Cove Park (King County

Tax Parcels 202406-9070 (City of Issaguah parcel) and 202406-9079

(Washington State Parks parcel), with an addition parcel is located south of I-90 King County Tax Parcel 356000-0140). The Public Land Survey System location of the property is NW ¼ of Section 20, Township 24 North, Range 6 East,

Willamette Meridian (W.M.).

PROJECT STAFF: Ann Olsen, RLA, Senior Project Manager; Jennifer Marriott, PWS, Senior

Ecologist; Aaron Ellig, Ecologist, Matt Wagner, Landscape Planner/Mitigation

Designer.

FIELD SURVEY: The Site was initially evaluated by Talasaea on 4 October 2018, with subsequent

visits on 8, 11, and 12 October 2018 to identify baseline existing conditions. Talasaea also made visits to the Site on 30 October 2018, 19 February 2019,

and 5 March 2019 to assess hydrology at the Site.

<u>CRITICAL AREAS DETERMINATION</u>: Lake Sammamish, Tibbett's Creek, Schneider Creek, and six (6) wetlands, Wetlands A – F, were identified within or adjacent to the project area. Five (5) of the wetlands (Wetlands A-E) were rated as Category III wetlands, and the sixth wetland (Wetland F) was rated as a Category II wetland. These wetlands are associated with the waterbodies listed above. Both Tibbett's Creek and Schneider Creek originate in the watershed south of I-90. They are both Class 2 streams with salmonids. Another wetland occurs off-site to the west in a swale (WSDOT Swale) south of I-90 parallel to the highway.

PROJECT NARRATIVE: Hyla Crossing is an assemblage of parcels on the south side of I-90 near Tibbett's Creek and SR-900. Currently, stormwater runoff is discharged directly to Tibbett's Creek with no flow control in place as the site was developed as early as the 1960s in some locations. Flow control is now required per the 2009 King County Surface Water Design Manual and the Rowley Center and Hyla Crossing Development Agreement, Appendix I (Utilities). Detention storage and individual pump stations pose an increased flood risk during heavy storm events and lead to larger environmental footprints when considering power consumption, maintenance requirements, and standby fuel storage. As a more efficient and appropriate solution, a regional pump station is being proposed to replace the need for individual detention systems and associated pump stations. The design will meet flow control requirements by pumping stormwater through a pipeline under I-90 to a nearshore outfall on a City owned parcel adjacent to Lake Sammamish. The pipeline will cross a Washington State Parks parcel and a City of Issaquah owned parcel on the north side of I-90, where the outfall is located. The intent of this important project is to provide conveyance to Lake Sammamish as efficiently as possible given the proximity of the project on the valley floor to the lake. The site, given its high groundwater table, cannot effectively detain nor treat stormwater through low impact development techniques at this scale.

<u>HYDROLOGY</u>: Hydrology for the wetlands within the project area is primarily from groundwater, precipitation, and surface water flows during heavy rain events that leads to ponding in dense mats of reed canarygrass. The wetlands in the project area generally drain towards the larger water bodies by natural gradients.

SOILS: Soils within the Project Area are mapped by the NRCS as Bellingham silt loam (Bh) and Sammamish silt loam (Sh). Areas mapped as Shalcar muck (Sm) and Puget silt clay loam (Pu) occur in proximity to the Project Area. All four (4) soil map units are identified as hydric soils by the NRCS Soil Data Access (SDA) Hydric Soils List.

<u>VEGETATION</u>: Vegetation across the two northern parcels consists almost entirely of reed canarygrass. Some forested vegetation and scrub-shrub vegetation is found along the banks and buffers of Tibbett's Creek and Lake Sammamish. Forested vegetation on-site consists of red alder, black cottonwood, several willow species, red-osier dogwood, salmonberry, and lady fern.

<u>PROPOSED PROJECT</u>: The Hyla Crossing Stormwater Force Main Project proposes to construct a new pipeline that will convey treated stormwater within a targeted range from a new pump station to a nearshore outfall next Lake Sammamish. The pipeline will total approximately 2,897 linear feet long. This pipeline will consist of a 24-inch HDPE force main to convey water to Lake Sammamish from the Hyla Crossing properties.

In 2017, an adjacent new development completed a bore under Tibbett's Creek for required utilities and in the process installed the 24-inch casing for the future pipeline for the Hyla Crossing stormwater force main. The new pipeline for this project will be connected to this existing casing stub located west of Tibbett's Creek. The pipeline will then bore under I-90 from where it will change direction heading northwest along NW Sammamish Rd before turning north to the outfall.

Currently, runoff from the Hyla Crossing neighborhood is discharged to Tibbett's Creek without flow control mechanisms. Future redevelopment of Hyla Crossing would be required to meet Level 2 Flow Control requirements. The use of a new outfall to discharge stormwater directly to Lake Sammamish was previously determined to meet the Level 2 flow control requirements as outlined in the Master Development Agreement (DA) between Rowley Properties and the City of Issaguah.

<u>REGULATORY REVIEW:</u> All critical area impacts must adhere to the policies and guidance for compensatory mitigation provided in the following documents:

- Issaquah Municipal Code, Chapter 18.10 -- Critical Areas;
- The Washington State Department of Ecology (DOE) Publication #06-06-011a, Wetland Mitigation in Washington State Part 1: Agency Policies and Guidance, and Part 2: Developing Mitigation Plans (Version 1), dated March 2006; and
- The Federal Compensatory Mitigation for Losses of Aquatic Resources Final Rule (33 CFR Parts 325 and 332, April 10, 2008), effective June 9, 2008.

The fundamental objective of the compensatory mitigation plan is to offset environmental losses resulting from unavoidable impacts to waters of the U.S. Based upon the guidance in the above documents, all proposed mitigation shall be based on best available science and shall demonstrate no net loss of critical area functions and values.

ASSESSMENT OF CRITICAL AREA IMPACTS: Both permanent and temporary critical area impacts will occur between the proposed pump station and the nearshore outfall at Lake Sammamish.

<u>Permanent Impacts</u>: Construction of the outfall will occur 10 feet landward of the ordinary high water mark of Lake Sammamish. Total impacts from the outfall will be approximately 314 square feet. The pipe will transition from a 24-inch welded steel pipe to a ductile iron pipe with an in-line elastomeric check valve at the outfall. The outfall will consist of a grate inlet bubble up structure with an aluminum bolt down grate. Eight inch round rock will be utilized to dissipate energy.

In addition, an 8-foot wide maintenance access trail will be required between NW Sammamish Rd and the nearshore outfall. This maintenance access trail will be approximately 8 feet wide and will consist of 4-6 inches of mulch. This trail will mainly be used for maintenance inspections by the City of Issaquah during the growing season and during heavy rain events. Permanent wetland impacts for both the outfall and the maintenance access trail are 5,863 square feet (sf) and permanent buffer impacts are 470 sf.

<u>Temporary Construction Impacts</u>: Pipeline construction between the end of the bore at the north side of I-90 and the nearshore outfall will temporarily impact both wetland and buffer areas. Temporary wetland impacts are 24,896 sf and temporary buffer impacts are 33,678 sf.

FLOODPLAIN & NATIVE VEGETATION IMPACT ASSESSMENT: No net loss of floodplain compensatory storage is proposed as part of this Project. A Habitat Impact Analysis (HIA) was prepared to assess the potential impacts to native habitats within the 100-year floodplain. The HIA concluded that the project determination of *May Affect, Not Likely to Adversely Affect (NLAA)* is appropriate for wetlands, streams, water quality or flow, floodplain refugia, or any type of wildlife habitat for listed or non-listed species.

<u>PROPOSED MITIGATION</u>: To mitigate for permanent wetland and buffer impacts, we are proposing purchasing credits at the Keller Farm Mitigation Bank (KFMB) recently approved by the Interagency Review Team (IRT) in December 2019. Per Issaguah Municipal Code (IMC) §18.10.720.I: Wetland

Mitigation Banking: The City may consider and approve replacement or enhancement of unavoidable adverse impacts to wetlands caused by development activities through an approved wetland mitigation bank, in advance of authorized impacts.

To mitigate for temporary wetland and buffer impacts for the pipeline construction, restoration is proposed. To mitigate for floodplain impacts, compensatory flood storage will be provided adjacent to the pump station in the buffer for Tibbett's Creek. Because the compensatory flood storage is located in the Tibbett's Creek Buffer, and as future requirement of the DA between Rowley Properties, Inc. and the City of Issaquah, 0.6 acres of the Tibbett's Creek buffer will also be restored as part of this project. (Originally, this work was planned to be completed when one million SF was developed in the Hyla Crossing neighborhood. To date, less than 200,000 SF has been developed). Mitigation will include replacing existing impervious surface area with native soils and vegetation.

Therefore, final mitigation proposed for the Hyla Crossing Pumped Stormwater Discharge Project are as follows:

- Purchase credits at the KFMB for permanent wetland and buffer impacts;
- Restore 24,896 sf of temporary impacts to Wetland E;
- Restore 33,678 sf of temporary impacts to Wetland E buffer;
- Restore 26,194 sf of Tibbett's Creek buffer for both compensatory flood storage and as per Appendix J (Critical Areas)

1 April 2020

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CHAPTER 1. INTRODUCTION

1.1 Report Purpose

This report is the result of a critical areas study for the Hyla Crossing Pumped Stormwater Discharge Project Area (referred to as "Project Area" hereinafter). The Project is a linear utility that will construct a new force main (pipeline) starting at a new pump station south of Interstate 90 (I-90) and ending at a nearshore outfall to Lake Sammamish (**Figure 1**). The Project Area crosses several ownerships including Applicant-owned property, Sammamish Cove Park (public land), and several existing rights-of-way, including for I-90 (**Figure 2**).

The purpose of this report is to identify, describe, and categorize critical areas on or adjacent to the Project Area; assess impacts resulting from the construction of the pump station, force main pipeline, and the stormwater outfall; provide a mitigation plan to compensate for proposed impacts to critical areas; and restore selected areas of the shoreline per City of Issaquah's Critical Areas Ordinance and Shoreline Master Plan.

This report has been designed to meet the Critical Areas Studies requirements as outlined under §18.10.410 of the Issaquah Municipal Code (IMC). Specifically, this report provides the following information:

- General property descriptions;
- · Methodology for critical areas investigations;
- Review and evaluation of existing resource information;
- Review and evaluation of critical areas on and adjacent to the Project Area;
- Regulatory review;
- Project description;
- Assessment of development impacts to critical areas;
- Mitigation proposal to offset critical areas impacts;
- Construction sequencing:
- Performance monitoring plan and schedule; and
- Summary

1.2 Statement of Accuracy

The critical area studies and regulatory reviews were conducted by trained professionals of Talasaea Consultants, Inc., in adherence to the protocols, guidelines, and generally accepted industry standards available at the time work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent, and within the limitations of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea Consultants does not warrant any assumptions or conclusions not expressly made in this report or based on information or analyses other than what is included herein.

1.3 Qualifications

Field investigations and evaluations were conducted by Talasaea staff including: Ann Olsen, RLA, Senior Project Manager; Jennifer Marriott, PWS, Senior Wetland Ecologist; Richard Tveten, Senior Ecologist; and Aaron Ellig, Ecologist. Mitigation design was prepared by Ann Olsen, Registered Landscape Architect, License #777. Ann has over 27 years in environmental planning, mitigation and landscape design, and project management. Jennifer Marriott has a Bachelor's Degree and a Master's Degree in Biology from University of Central Florida, and a second Master's Degree in Soil and Environmental Science from the University of Florida. She has over 16 years of experience in wetland delineations and environmental permitting. Richard Tveten has a Master's Degree in Ecology from Western Washington University and 23 years of experience in wetlands delineation, restoration ecology and stormwater management. Aaron

Ellig has a Bachelor's Degree in Environmental Science from Western Washington University. He has 5 years of experience in restoration ecology with 3 years of experience working with wetland mitigation and monitoring.

CHAPTER 2. PROPERTY OVERVIEW

2.1 Project Overview

Hyla Crossing is an assemblage of already developed parcels on the south side of I-90. Before redevelopment is possible, engineered flow control must be implemented as part of the stormwater management design. The project proposes to construct a regional pump station, pipeline, and nearshore outfall to reduce the risk of flooding and eliminate the need for multiple individual detention systems and pump stations in the area. The proposed development is outlined in the Rowley Development Agreement (DA) and the Hyla Crossing Master Drainage Plan.

The proposed force main will connect a new pump station to a new nearshore outfall at Lake Sammamish. Details on the elements of this Project are provided below in **Chapter 6**. This force main will convey designated stormwater to Lake Sammamish from the various redevelopments proposed within Hyla Crossing. The proposed force main is comprised of six (6) elements:

- 1. Construction of a new pump station;
- 2. Tie into existing underground infrastructure for short segment;
- 3. Cross I-90 (bore);
- 4. Extend pipeline to Lake Sammamish;
- 5. Construct new outfall at edge of Lake Sammamish; and
- 6. Connect pipeline to new outfall.

The Project Area is defined as the pipeline easement within which the pipeline will be constructed and maintained. A greater Study Area was evaluated in order to assess the critical areas that occur in the vicinity of the Project Area. The below discussion of existing conditions relates to both the narrow Project Area and the greater Study Area. The City of Issaquah requires an evaluation of wetlands within 200 feet of a site, and therefore, for the purposes of this report, the Study Area was expanded to include all lands within 200 feet of the Project Area.

2.2 Property Description and Location

The Project Area is a new utility corridor that starts at an undeveloped parcel owned by the Applicant (King County tax parcel number 356000-0140; <u>Latitude 47.550224</u>, <u>Longitude - 122.067567</u>) and ends at Lake Sammamish within the Greenwood Trust property owned by the City of Issaquah, also known as Sammamish Cove Park (King County tax parcel number 202406-9070; <u>Latitude 47.555503</u>, <u>Longitude -122.073909</u>) (**Figures 2** and **3**). The Public Land Survey System location of the Project Area is the NW ¼ of Section 20, T24N, R6E.

The Project Area for this force main will pass through existing rights-of-way (ROW) for several local roads, including NW Poplar Way and NW Sammamish Road, as well as for the Washington Department of Transportation (WSDOT)-managed I-90.

In 2017, an adjacent new development completed a bore under Tibbett's Creek for required utilities and in the process installed the 24-inch pipe for the future connection to the Hyla Crossing stormwater force main. The new pipeline for this project will be connected to this existing pipe stub located within NW Poplar Way west of Tibbett's Creek. The pipeline will then bore under I-90 from where it will change direction heading northwest along NW Sammamish Rd before turning north to the outfall. The segments crossing under Tibbett's Creek and within

NW Poplar Way were previously installed as part of other projects in the area, and thus, these segments are not included within this report/documentation.

2.3 Existing Site Conditions

The Project Area south of I-90 is developed except for the WSDOT-maintained swales (portions of which were previously identified as linear wetlands) and Tibbett's Creek. Very little native vegetation occurs within this portion of the Project Area outside of the immediate riparian corridor. Extensive coverage by invasive species are present, including reed canarygrass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*).

The Project Area north of I-90 is City-designated open space (Greenwood Trust/Sammamish Cove parcel) that is adjacent to Lake Sammamish State Park. This property is undeveloped, though a bridge over Tibbett's Creek allows access to this property from a parking lot for the State Park. The Greenwood Trust parcel has informal mulched walking trails throughout, including through portions of the wetland that are dry in the summer months (**Sheet W1.0** in **Appendix E**). The Study Area extends to include the adjacent parcel to the east that is part of the State Park on which two existing baseball fields with minimal infrastructure are located (King County tax parcel number 202406-9079). This parcel is currently excluded from the Project Area, though discussions were started, and later discarded, about potentially using this parcel for construction staging.

Vegetation throughout much of the Project Area north of I-90 consists of reed canarygrass and Himalayan blackberry in both the wetland and non-wetland areas. Various species of trees are located within the Study Area, within the uplands near Tibbett's Creek, and within the wetlands closer to Lake Sammamish. Shrub and tree sized willows of various species occur closer to the lake. Within the past 10 years there have been various levels of effort to restore portions of this large wetland unit by planting native trees and shrubs. The proposed pipeline route will not impact any of these ongoing efforts.

The topography is generally flat and gently sloping down towards Lake Sammamish. Tibbett's Creek is located within a clearly defined channel that occurs in the southeast corner of the Project Area, which then continues north and west to Lake Sammamish in the vicinity of the Project Area. Schneider Creek occurs within the Study Area west of the proposed pipeline corridor. An existing dock is located within the Greenwood Trust parcel within the Study Area but beyond the limits of the Project Area. It is our understanding that this dock is grandfathered to the parcel.

CHAPTER 3. METHODOLOGY

The critical areas analysis of the Project Area involved a two-part effort. The first part consisted of a preliminary assessment of the Project Area and immediate surrounding area using published environmental information. The City of Issaquah requires an evaluation of wetlands, potential wetlands, and streams within 200 feet of a site (Study Area). This information included:

- 1. Wetland and soils information from resource agencies;
- 2. Environmentally critical areas information from the City of Issaguah and King County;
- 3. GIS analysis of orthophotography and LIDAR data; and
- 4. Relevant studies completed or ongoing on, or in the vicinity of the Project Area.

The second part of our effort consisted of field investigations where direct observations of existing environmental conditions were made. Plant communities, soils, hydrology, stream, lake, and wildlife habitat conditions were observed. This information was used to help characterize critical areas and define the limits of wetland boundaries and the ordinary high

water mark (OHWM) of adjacent streams and Lake Sammamish for regulatory purposes (see **Section 3.2 – Field Investigation** below).

3.1 Background Data Review

Background information from the following sources was used prior to our field investigations:

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for the Issaquah Quadrangle;
- Natural Resources Conservation Service (NRCS) Soil Survey for King County Area;
- City of Issaquah GIS database;
- King County GIS database;
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species online mapping program information;
- StreamNet and SalmonScape databases;
- Orthophotography from NAIP, Google Earth Pro, and Earth Explorer; and
- LiDAR terrain data from DNR LiDAR Portal.

3.2 Field Investigation

The Project and Study Areas were initially evaluated by Talasaea on 4 October 2018, with subsequent visits on 8, 11, and 12 October 2018 to identify baseline existing conditions. Talasaea also made visits to the Project Area on 30 October 2018, 19 February 2019, and 5 March 2019 to assess hydrology within the large wetland that occurs within both the Project and Study Areas on the Greenwood Trust property.

Critical areas (wetlands, lake OHWM, and streams) were evaluated and delineated on 11 October 2018, and again on 11 September 2019.

Wetlands were delineated using the routine methodology described in the U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation and Identification Manual: Western Mountains, Valleys, and Coast Region, Version 2 (U.S. Army Corps of Engineers 2010). Wetlands were rated using the Washington State Wetland Rating System for Western Washington (Hruby 2014). Wetland buffers were assigned according to City of Issaquah Municipal Code (IMC) §18.10.640.

Plant species were identified according to the taxonomy of Hitchcock, Cronquist, Owensby, and Thompson (Hitchcock, et al. 1969). Taxonomic names were updated, and plant wetland status was assigned according to the *North American Digital Flora: National Wetland Plant List, Version 2.4.0* (Lichvar 2012). Wetland classes were determined with the USFWS's system of wetland classification (Cowardin, *et al.* 1979). Vegetation was considered to be hydrophytic if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter. (i.e., facultative, facultative wetland, or obligate wetland).

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the Corps' Regional Supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology one Primary Indicator or two Secondary Indicators must be demonstrated. Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historical records, visual observation of saturated soils, and visual observation of inundation.

Soils were considered hydric if one or more of the hydric indicators listed in the Corps' Regional Supplement are present. Indicators include the presence of organic soils, reduced, depleted, or gleyed soils, or redoximorphic features in association with reduced soils.

An evaluation of patterns of vegetation, soil, and hydrology was made along the interface of wetland and upland. Wetland boundary points were delineated and flagged for later survey. **Appendix A** contains data forms prepared by Talasaea for representative locations in both upland and wetland. These data forms document the vegetation, soil, and hydrology information that aided in the wetland boundary determination.

Wetlands were rated using the Washington Department of Ecology's (WDOE) *Washington State Wetland Rating System for Western Washington* (Hruby 2014). **Appendix B** contains the WDOE wetland rating forms for the wetlands identified.

The OHWM of streams was delineated using the methodology described in *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson, *et al.* 2016). Streams were typed based on the water typing criteria contained under WAC 222-16-031, Interim water typing system, which is consistent with IMC §18.10.780, as well as WAC 222-16-030, water typing system. WAC 222-16-031 provides a water type conversation table that relates the stream typings between WAC 222-16-030 and WAC 222-16-031.

CHAPTER 4. RESULTS

This section describes the results of our in-house research and field investigations. For the purposes of this report, the term "vicinity" shall mean those areas within ¼ mile of the Project Area.

4.1 Analysis of Resource Information

4.1.1 National Wetlands Inventory (NWI)

The NWI maps the following features on and within the vicinity of the Project Area (Figure 4):

- L1UBH: Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, consistent with portions of Lake Sammamish.
- PFOC: Palustrine, Forested, Seasonally Flooded,.
- PSSC: Palustrine Scrub-Shrub Seasonally Flooded.
- PSSCx: Palustrine, Scrub-Shrub, Seasonally Flooded, Excavated.
- PEM1A: Palustrine, Emergent, Persistent, Temporarily Flooded.
- PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded
- R4SBC: Riverine Intermittent Streambed Seasonally Flooded stream consistent with the location of Schneider Creek

4.1.2 Natural Resources Conservation Service

The Natural Resources Conservation Service maps two (2) map units as overlapping the Project Area, including Bellingham silt loam (Bh) and Sammamish silt loam (Sh) (**Figure 5**). Areas mapped as Shalcar muck (Sm) and Puget silt clay loam (Pu) occur in proximity to the Project Area. All four (4) soil map units are identified as hydric soils by the NRCS Soil Data Access (SDA) Hydric Soils List.

4.1.3 King County Critical Areas Map

King County maps several types of critical areas on and adjacent to the Project Area (**Figure 6**). King County maps three (3) streams and one (1) wetland in the Project Area. Lake Sammamish is identified as a large waterbody adjacent to the Project Area's western boundary. The first stream, Tibbett's Creek, is mapped as flowing north through the Project Area before crossing I-90 and then turning northwest towards Lake Sammamish. The second stream, Schneider Creek, approaches the Greenwood Trust parcel from the south and flows north towards Lake Sammamish west of the Project Area. The third stream is an unnamed and unrated tributary to

Tibbett's Creek that enters Tibbett's Creek near its 90-degree turn north of I-90 outside of the Project Area.

One large wetland is mapped as occurring in the northwest corner of the Greenwood Trust parcel and extending off-site to the north. The majority of the Greenwood Trust parcel falls within the FEMA preliminary 100-year floodplain, and a small portion of this parcel is mapped as a seismic hazard area.

4.1.4 City of Issaguah Critical Areas Map

The City of Issaquah does not map critical areas (wetlands, streams, steep slopes) as a data layer within the City's GIS Data Viewer. The City does, however, map portions of the Project Area within the 100-year floodplain of Lake Sammamish. Tibbett's Creek and Schneider Creek are depicted on the database as well with Tibbett's Creek identified as a floodway (**Figure 7**).

4.1.5 Priority Habitats and Species

We reviewed WDFW's Priority Habitats and Species online mapping tool. The following priority species are mapped on and adjacent to the Project Area:

- Winter Steelhead (Oncorhynchus mykiss): Occurrence, breeding area
- Coho salmon (*Oncorhynchus kisutch*): Occurrence, breeding area, migration
- Sockeye salmon (*Oncorhynchus nerka*): Occurrence, migration
- Resident Coastal Cutthroat trout (Oncorhynchus clarki): Occurrence, migration
- Kokanee trout (Oncorhynchus nerka): Occurrence, migration
- Townsend's Big-eared Bat (Corynorhinus townsendii): Communal Roost
- Yuma myotis Bat (*Myotis yumanensis*): Breeding area
- Little Brown Bat (Myotis lucifugus): Breeding area
- Big Brown Bat (Eptesicus fuscus): Communal roost

In addition to priority species, the below priority habitats are mapped:

- Freshwater Emergent Wetland aquatic habitat
- Freshwater Forested/Shrub Wetland aquatic habitat
- Freshwater Pond aquatic habitat
- Lake aquatic habitat

4.1.6 SalmonScape and StreamNet

Tibbett's Creek is mapped by SalmonScape and StreamNet as a Class 2 fish-bearing stream. Species listed as using the creek are: Winter Steelhead trout, Kokanee salmon, Sockeye salmon, Resident Coastal Cutthroat trout, Chinook salmon, and Coho salmon. On both databases, a stream in the vicinity of Schneider Creek is shown but not named and not identified as fish-bearing.

4.1.7 Federally Listed Species

Both Chinook salmon status: endangered) and steelhead trout (aka winter steelhead, status: threatened) are federally listed species for the Puget Sound region that are mapped as occurring within Lake Sammamish and Tibbett's Creek.

4.2 Analysis of Existing Site Conditions

Existing site conditions are outlined below and are based on delineation efforts undertaken as part of this specific project, as well as compiling previous delineations that were completed in recent years by projects in the surrounding areas.

Feature ID	Project Area	Study Area
Wetland A	No	YES
Wetland B	No	YES
Wetland C	No	YES
Wetland D	No	YES
Wetland E	YES	YES
Wetland F	No	YES
Tibbett's Creek Wetland	No	YES
WSDOT Swale (Linear Wetland)	No	YES
Tibbett's Creek	No	YES
Schneider Creek	No	YES
Lake Sammamish	YES	YES

Table 1. Summary of Critical Areas Locations within Project and Study Areas.

4.2.1 Wetlands

Six (6) regulated wetlands were identified on, or in the vicinity of, the Project Area north of I-90 on the Greenwood Trust property as well as the adjacent State Park parcel (**Sheet W1.0** in **Appendix E**). These wetlands are described in more detail below. Additional wetlands occur near the Project Area south of I-90 that were previously identified on recently completed projects. This includes a large wetland west of Tibbett's Creek (Tibbett's Creek Wetland), south of the Project Area, as well as a small segment of a linear wetland that occurs in conjunction with one of the WSDOT-maintained swales (WSDOT Swale - West) near where the project proposes to bore under I-90. These wetlands are described in more detail below as well.

4.2.1.1 Wetland A

Wetland A is a depressional, palustrine emergent wetland according to the Hydrogeomorphic and Cowardin wetland classification systems, respectively (Brinson, n.d.) (Cowardin, et al. 1979). The wetland totals 7,657 sf (0.18 acres) on the Project Area. This wetland is located in the southeast corner of the Washington State Parks parcel on the north side of I-90. Wetland A is primarily vegetated with reed canarygrass.

Soils in this wetland are generally a brown (10YR 4/2) sandy loam from 0-12 inches below the soil surface and a dark brown (10YR 4/1) loam with dark yellowish brown (10YR 4/6) redoximorphic concentrations from 12-17 inches. Hydrology for Wetland A is provided primarily by groundwater and direct precipitation. A plastic culvert drains surface water from Wetland A to Wetland B. No direct hydrology observations were made at the time of the site visit, however, hummocky reed canarygrass suggests standing surface water in the spring.

Wetland A scored 7 points for Water Quality Functions, 6 points for Hydrologic Functions, and 5 points for Habitat Functions. The Total Score for Functions was 18. This satisfies the criteria for classification of Wetland A as a City of Issaquah Category III wetland per IMC §18.10.640.C. Category III wetlands with a Habitat Function score of 5 require a standard buffer of 75 feet.

4.2.1.2 Wetland B

Wetland B is a depressional, palustrine emergent wetland according to the Hydrogeomorphic and Cowardin wetland classification systems, respectively. The wetland totals 9,978 sf (0.23 acres) on the Project Area. This wetland is located on the east side of the Washington State Parks parcel, just north of Wetland A. Wetland B is primarily vegetated with reed canarygrass. Other species that occur within the wetland include Oregon ash (*Fraxinus latifolia*) and a single black cottonwood (*Populus trichocarpa*) tree.

Soils in this wetland are generally a brown (10YR 4/3) loam from 0-10 inches below the soil surface and a dark brown (10YR 4/1) silt loam with yellowish brown (10YR 4/4) redoximorphic concentrations from 12-17 inches. Hydrology for Wetland B is provided primarily by groundwater, surface water inputs from Wetland A, and direct precipitation. Surface water drains water from Wetland B to Tibbett's Creek. No direct hydrology observations were made at the time of the site visit, however, hummocky reed canarygrass suggests standing surface water in the spring.

Wetland B scored 7 points for Water Quality Functions, 6 points for Hydrologic Functions, and 5 points for Habitat Functions. The Total Score for Functions was 18. This satisfies the criteria for classification of Wetland B as a City of Issaquah Category III wetland per IMC §18.10.640.C. Category III wetlands with a Habitat Function score of 5 require a standard buffer of 75 feet.

4.2.1.3 Wetland C

Wetland C is a depressional, palustrine emergent wetland according to the Hydrogeomorphic and Cowardin wetland classification systems, respectively. The wetland totals 2,122 sf (0.05 acres) on the Project Area. This wetland is located east side of the Washington State Parks parcel, north of Wetland B. Wetland C is primarily vegetated with reed canarygrass.

Soils in this wetland are generally a brown loam and silt loam with slight mottling. Hydrology for Wetland C is provided primarily by groundwater, surface water flows from Wetland B, and direct precipitation. A plastic 6" flex pipe drains surface water under the trail from Wetland C to Tibbett's Creek. No direct hydrology observations were made at the time of the site visit.

Wetland C scored 7 points for Water Quality Functions, 6 points for Hydrologic Functions, and 5 points for Habitat Functions. The Total Score for Functions was 18. This satisfies the criteria for classification of Wetland C as a City of Issaquah Category III wetland per IMC §18.10.640.C. Category III wetlands with a Habitat Function score of 5 require a standard buffer of 75 feet.

4.2.1.4 Wetland D

Wetland D is a depressional, palustrine emergent wetland according to the Hydrogeomorphic and Cowardin wetland classification systems, respectively. The wetland totals 4,417 sf (0.1 acres) on the Project Area. This wetland is located in the center of the Washington State Parks parcel. Wetland D is primarily vegetated with reed canarygrass.

Soils in this wetland are generally a brown loam and silt loam with slight mottling. Hydrology for Wetland D is provided primarily by groundwater and direct precipitation. A plastic culvert drains surface water from Wetland D to Tibbett's Creek. No direct hydrology observations were made at the time of the site visit.

Wetland D scored 7 points for Water Quality Functions, 6 points for Hydrologic Functions, and 5 points for Habitat Functions. The Total Score for Functions was 18. This satisfies the criteria for classification of Wetland D as a City of Issaquah Category III wetland per IMC §18.10.640.C. Category III wetlands with a Habitat Function score of 5 require a standard buffer of 75 feet.

4.2.1.5 Wetland E

Wetland E is a slope wetland that transitions to a lacustrine fringe wetland where this wetland occurs adjacent to Lake Sammamish (Hydrogeomorphic wetland classification system). This wetland is classified as a palustrine emergent/forested wetland consistent with the Cowardin wetland classification system. The nearshore portion of the wetland is forested with an emergent understory. The wetland totals 475,261 sf (17.1 acres) on the Project Area. This wetland extends over the majority of the Greenwood Trust parcel. Wetland E occurs within shoreline jurisdiction due to its location adjacent to Lake Sammamish, a Shoreline of the State.

Wetland E is dominated by reed canarygrass across the vast majority of the wetland except near the lake shore. The vegetation near the lake shore consists of black cottonwood, several species of willow (*Salix spp.*), red osier dogwood (*Cornus sericea*), salmonberry (*Rubus spectabilis*), Himalayan blackberry, black twinberry (*Lonicera involucrata*), highbush cranberry (*Viburnum opulus*), and lady fern (*Athyrium filix-femina*).

Soils in this wetland are generally a brown loam and silt loam with slight mottling. Hydrology for Wetland E is provided primarily by groundwater and direct precipitation except for those areas of the wetland occurring adjacent to the lake. Water generally flows down gradient from east to west towards Lake Sammamish. Several areas of shallow surface water ponding and a high water table were observed throughout the early parts of the growing season. This wetland is typically dry in the summer months with little saturation and no inundation except where the lake supports wetland hydrology.

Wetland E scored 7 points for Water Quality Functions, 6 points for Hydrologic Functions, and 6 points for Habitat Functions. The Total Score for Functions was 19. This satisfies the criteria for classification of Wetland E as a City of Issaquah Category III wetland per IMC §18.10.640.C. Category III wetlands with a Habitat Function score of 5 require a standard buffer of 75 feet.

4.2.1.6 Wetland F

Wetland F is a riverine, palustrine scrub-shrub wetland associated with Tibbett's Creek. The wetland totals 6,446 sf (0.15 acres) on the Project Area. This wetland is located on the southern side of Tibbett's Creek within the greater stream channel. Wetland F appears to have been previously restored and consists of diverse native shrubs. The vegetation within this wetland consists of red alder (*Alnus rubra*), black cottonwood, willows, red osier dogwood, salmonberry, Himalayan blackberry, black twinberry, and thimbleberry (*Rubus parviflorus*).

Soils in this wetland are generally a brown loam and silt loam with slight mottling. Hydrology for Wetland F is provided primarily by groundwater and overbank flooding from Tibbett's Creek.

Wetland F scored 8 points for Water Quality Functions, 7 points for Hydrologic Functions, and 6 points for Habitat Functions. The Total Score for Functions was 21. This satisfies the criteria for classification of Wetland F as a City of Issaquah Category II wetland per IMC §18.10.640.C. Category II wetlands with a Habitat Function score of 6 require a standard buffer of 100 feet.

4.2.1.7 Tibbett's Creek Wetland

The Tibbett's Creek Wetland is a large wetland complex that occurs south of the Project Area, on the west side of Tibbett's Creek. This large wetland was previously identified, delineated, and rated as part of several projects in this area. No datasheets or rating sheets are provided for this wetland as it occurs beyond the Project Area. Tibbett's Creek occurs within the buffer for this wetland between this wetland and the Project.

4.2.1.8 WSDOT Swales

A linear wetland was previously identified in the ROW on the south side of I-90 as part of the Anthology Apartments Project. This linear wetland is part of the WSDOT maintenance swale that manages runoff from I-90 south of the highway. Two separate swales are associated with the WSDOT ROW and are identified as WSDOT Swale – East and WSDOT Swale – West, which are separated by Tibbets Creek. No datasheets or rating sheets are provided for this wetland as part of this report.

4.2.2 Streams

Two (2) streams, Schneider Creek and Tibbett's Creek, were identified on or adjacent to the Project Area.

4.2.2.1 Schneider Creek

Schneider Creek is located along the southwest edge of the Greenwood Trust parcel that discharges into Lake Sammamish. Previous beaver activity in this stream has affected the channel and flows have periodically been rerouted through the southwest corner of Wetland E as a result of beaver dams. The most recent dams were removed in 2019 to redirect stream flow back into the main stream channel. Schneider Creek is identified as a Class 2 watercourse with salmonids. Class 2 streams used by salmonids in the City of Issaquah require a standard 100-foot buffer measured landward from the OHWM. Part of the buffer for Schneider Creek overlaps Wetland E.

4.2.2.2 Tibbett's Creek

Tibbett's Creek starts south of the Project Area and conveys regional drainage to Lake Sammamish. Tibbett's Creek crosses the Project Area south of I-90 before flowing under I-90. Tibbett's Creek then flows along the east side of the State Park parcel before making a 90-degree turn to the northwest towards Lake Sammamish.

Large portions of Tibbett's Creek occur within a clearly defined area that is designated as a floodway. Mapped 100-year floodplain associated with Tibbett's Creek extends into the Tibbett's Creek Wetland, as well as into the WSDOT swales south of I-90. Additional mapped 100-year floodplain occurs where Tibbett's Creek conflues with Lake Sammamish, and portions of this floodplain extend over much of Wetland E within the Greenwood Trust property. Tibbett's Creek itself is located entirely outside of the Project Area. Tibbett's Creek is identified as a Class 2 watercourse with salmonids. Class 2 streams used by salmonids in the City of Issaguah require a standard 100-foot buffer measured landwards from the OHWM.

4.2.2.3 NW Sammamish Rd Swale

The NW Sammamish Rd Swale is located on the north side of NW Sammamish Road. The swale runs from east to west and is approximately 600 feet in length before the channel disperses into the adjacent wetland system (Wetland E). The swale is a constructed feature to manage surface runoff with no direct surface connections to streams. The swale is identified as a linear wetland feature that is associated with Wetland E. It should be noted that the NW Sammamish Rd Swale is not a separate feature, but rather a distinctly different part of Wetland E that is located along the southern boundary. The swale is heavily disturbed and functions to convey stormwater from the adjacent roads.

Hydrology for the swale is primarily supported by two 12-inch culverts and one 18-inch culvert that feed runoff into this feature from the surrounding area, as well as sheet flows from the road. These culverts line up directly with the stormwater drains along I-90 and NW Sammamish Road. Hydrology appears to be present for short durations throughout the year and is presumed to correlated with heavy rain events.

Typical vegetation along the entire reach is reed canarygrass and Himalayan blackberry. Common invasive vegetation identified within the swale such as thistle spp., willowherb, and common mullein indicating prolonged periods of dry conditions.

4.2.3 Lake Sammamish

Lake Sammamish is a large lake located adjacent to the Project Area that is part of the regional stormwater management. There is a lake fringe wetland (portion of Wetland E). Lake Sammamish bathymetry adjacent to the shoreline near the Project Area reflected a shallow water depth extending a substantial distance into the open water portion of the lake. Sediment plumes are periodically present in the broad vicinity of the Project area, as indicated via a review of aerial imagery, which are associated with where Tibbett's and Schneider Creeks

discharge into Lake Sammamish, east and west of the Project Area, respectively. A small cove occurs in the Lake Sammamish shoreline where the Project Area is proposed.

The OHWM of Lake Sammamish was evaluated in the field based on field indicators. However, Lake Sammamish also has a defined OHWM elevation (standard elevation of 31.76 (feet) NAVD88 or 28.18 (feet) NGVD29, Shoreline Master Program (SMP) Chapter 4.1.1.4) defined by a set elevation, which was used for the purposes of this project. Buffers for Lake Sammamish are variable and dependent on the SMP based on the type of project proposed. Buffers and setbacks off Lake Sammamish do not apply to water-dependent utilities, such as stormwater discharge and outfall projects (SMP Chapter 4.5, Table 2 Development Standards for Shoreline Environments).

4.2.4 Floodplain Area

The City of Issaquah has identified the regulatory floodplain as areas of special flood hazard, which correspond with the FEMA 100-Year Floodplain. A Special Flood Hazard Area (SFHA) is defined as the land area covered by the floodwaters of the base flood on National Flood Insurance Program (NFIS) Maps. Tibbett's Creek is mapped as Floodway but no parts of the Project Area are mapped as a Channel Migration Area, though portions of the Project Area are mapped within the 100-Year FEMA Floodplain. The 100-Year FEMA Floodplain (SFHA) as mapped by King County iMap is shown in **Photo 1** below. The 100-year floodplain as mapped by FEMA in Firmette is consistent with the maps provided by the City of Issaquah (Flood Map #53033C0687F, Panel 687 of 1725 for King County, Washington). The two maps (City vs County) are different because the original FEMA map (shown on the left) has been superseded by a Letter of Map Revision (LOMR). The LOMR is reflected in the King County iMap. The result is that the floodplain is much more confined through the project site





Photo 1. Mapped 100-year FEMA floodplain over the Site (City Map, Left, 1995; King County iMap, Right, 2020).

CHAPTER 5. ANALYSIS OF CRITICAL AREAS REGULATIONS

5.1 City of Issaguah

The City of Issaquah land use designation for the Hyla Crossing neighborhood, which includes the proposed force main, is Urban Village. The Rowley properties, along with several others south of I-90, are a part of a Development Agreement (DA). Previous delineations and stipulations outlined in this previously approved DA will be followed to ensure all parts of this agreement are met. See **Appendix C** for the Section J of the DA relating to critical areas.

Critical areas within the Project Area are subject to the regulations of the City of Issaquah's Shoreline Master Program (SMP) and Issaquah Municipal Code (IMC) Critical Areas Chapter 18.10.

5.1.1 Non-Shoreline Jurisdiction

The majority of the Project Area occurs outside of shoreline jurisdiction except for those areas that fall within Wetland E. IMC §18.10 applies to all critical areas within the Project and Study Areas, except for Wetland E, and defines the allowable uses and modifications to these critical areas, as well as outlining appropriate mitigation measures.

5.1.2 Shoreline Jurisdiction

IMC Chapter 18.10.765 notes that "development activity within 200 feet of the OHWM of Lake Sammamish is subject to the Shoreline Master Program (SMP)." The SMP ultimately redirects back to IMC Chapter 18.10 to address impacts to critical areas and subsequent mitigation to compensate for critical areas impacts. IMC §18.10.720 outlines the requirements for mitigation for wetland impacts. In lieu of Permittee Responsible mitigation on the site, IMC §18.10.720.I allows for the use of mitigation banking:

<u>Wetland Mitigation Banking:</u> The City may consider and approve replacement or enhancement of unavoidable adverse impacts to wetlands caused by development activities through an approved wetland mitigation bank, in advance of authorized impacts.

The Project Area occurs within the service area of the newly approved Keller Farm Mitigation Bank (KFMB) recently approved by the Interagency Review Team (IRT) in December 2019.

Lake Sammamish is designated as a Shoreline of the State, and the section of shoreline adjacent to the Project Area has been designated as an Urban Conservancy shoreline environment. A large wetland, Wetland E, falls within the 200-foot shorelands, and extends beyond the 200-foot width shorelands. The extent of this wetland extends beyond the mapped FEMA 100-year floodplain so it is presumed that shoreline jurisdiction will extend beyond Lake Sammamish through the entirety of the Wetland E boundaries.

Utilities are an allowable use within Lake Sammamish Urban Conservancy through a Shoreline Substantial Development Permit (SSDP). Buffers and setbacks from the SMP do not apply to water-dependent uses such as stormwater outfalls, therefore, no buffers have been applied to Lake Sammamish for this Project.

5.2 State and Federal Regulations

5.2.1 Washington State Regulations

Critical areas (wetlands and streams) on the Project Area are subject to regulation at the State level primarily by the following statutes:

- State Water Pollution Control Act (administered by WDOE)
- Section 401 of the Federal Clean Water Act (administered by WDOE)
- Hydraulic Code of Washington (administered by WDFW)

WDOE uses Section 401 State Water Quality Certification (WQC) as the primary mechanism for implementing the provisions of the State Water Pollution Control Act. Section 401 WQC is typically issued in conjunction with Section 404 permits from the US Army Corps of Engineers (Corps). Any impacts within the OHWM of streams or lakes, or that have the potential to affect streams or lakes, would also be regulated under the Hydraulic Code of Washington as part of the Hydraulic Project Approval (HPA) permit process.

5.2.2 Federal Regulations

Critical areas (wetlands and streams) on the Project Area are also subject to Federal regulations under Sections 401 and 404 of the Clean Water Act. The Corps is responsible for administering compliance with Section 404 via the issuance of Nationwide or Individual Permits for any fill or dredging activities within wetlands, streams, or other "Waters of the United States". Direct impacts (filling or dredging) to wetlands are being proposed for this project and will require 401 and 404 permits.

Federal regulations also evaluate the Project against applicable regulations for federally listed species through the ESA, and an effects determination is approved through this ESA review process.

CHAPTER 6. PROPOSED PROJECT

The Hyla Crossing Pumped Stormwater Discharge Project proposes to construct a new pipeline that will convey treated stormwater within a targeted range from a new pump station to a nearshore outfall to Lake Sammamish. The pipeline will total approximately 2,897 linear feet long. This pipeline will consist of a 24- inch HDPE force main to convey water to Lake Sammamish from properties south of I-90.

In 2017, an adjacent new development completed a bore under Tibbett's Creek for required utilities and in the process installed the 24-inch pipe for the future connection to the Hyla Crossing stormwater force main. The new pipeline for this project will be connected to this existing pipe stub located within NW Poplar Way west of Tibbett's Creek. The pipeline will then bore under I-90 from where it will change direction heading northwest along NW Sammamish Rd before turning north to the outfall.

Currently, runoff from the Hyla Crossing neighborhood is discharged to Tibbett's Creek without flow control mechanisms. Future redevelopment of Hyla Crossing is required to meet Level 2 Flow Control requirements. The use of a new outfall to discharge stormwater directly to Lake Sammamish was previously determined to meet the Level 2 flow control requirements as outlined in the Development Agreement (DA) between Rowley Properties and the City of Issaquah.

6.1 Project Elements

6.1.1 Pump Station

The pump station will be an approximately 900 square-foot concrete structure housing four pumps. Flows between 50 percent of the 2-year and the 50-year pre-developed peak flow will be split between the new Lake Sammamish outfall structure through the proposed force main and the nearby WSDOT Swale - East which will convey these flows to Tibbett's Creek. Tibbett's Creek base and flood flows will be discharged to the WSDOT Swale - East as well. This swale is considered a non-regulated feature that conveys stormwater to Tibbett's Creek in its existing condition. The WSDOT Swale - East outfall will consist of a structured bubble up system that will be placed above the OHWM of Tibbett's Creek and above WSDOT Swale - East. Estimated 100-year peak flows will not exceed 19 cubic feet per second (cfs) through the bubble up structure based on hydraulic models. The outfall will comply with all level 2 flow control requirements as outlined by the City of Issaquah. Standard temporary construction sediment and flow control best management practices (BMPs) will be implemented. Stormwater will be diverted through the remaining two pumps to the nearshore outfall next to Lake Sammamish in accordance with the Tibbett's Creek level 2 flow control standard.

The Lake Sammamish force main route, upon leaving the pump station, will tie into an existing, buried pipeline that was installed in conjunction with previous nearby developments. This

buried pipe extends underneath Tibbett's Creek and a portion of the newly constructed NW Poplar Way west of the pump station. The existing pipe ends at the northwest corner of the new office building commercial development, in WSDOT Swale – West, and was positioned to set this Project up for the turn to bore underneath I-90.

Based on hydraulic modeling, the peak flow through the Lake Sammamish force main will not exceed 11.6 cfs. Lake Sammamish is designated as an exempt receiving water and therefore does not have applicable flow control requirements.

6.1.2 I-90 Force main Crossing (Bore)

The I-90 force main crossing will involve boring underneath I-90. The sending and receiving pits will be located outside of the WSDOT ROW for I-90 south of the highway but will occur partially within the NW Sammamish Rd ROW north of the highway. The I-90 force main crossing will utilize a trenchless construction method to minimize impacts to critical areas and reduce impacts to general highway functionality.

Several alternative crossing locations and construction methods were considered to determine the most appropriate option for this location. Existing site constraints for this crossing, including a sanitary sewer located at Northwest Poplar Way and the eastbound I-90 swale, restricted what boring locations, angles, and depths were best suited for this Project. The existing infrastructure pushed the casing to 14-feet below highway grade, which is the current conceptual design. Final design as per WSDoT regulations and issued permit.

6.1.3 NW Sammamish Rd Swale

The NW Sammamish Rd Swale north of I-90 will be temporarily impacted to install the pipeline below grade. This roadside swale was delineated as part of Wetland E due to the connected vegetation and wetland hydrology.

The installation of the force main north of I-90 will use open cut construction methods once pipeline resurfaces north of I-90. The pipeline will follow this roadside swale parallel to NW Sammamish Road until the pipeline route turns towards Lake Sammamish. Much of the pipeline in this segment will occur within the road prism at the upper limits of the roadside swale, and thus impacts to critical areas will be minimized.

All equipment will be staged on NW Sammamish Road and all construction during this phase is proposed to occur outside of Wetland E.

6.1.4 Pipeline Connecting Road to Outfall

The force main stretch between NW Sammamish Road and the nearshore outfall will use an open cut installation method through Wetland E. The pipe is expected to be laid approximately three (3) feet below the soil surface before being backfilled by suitable material. Heavy equipment will be necessary during the entire installation. Precautions will be taken to minimize disturbances to the wetland, including soil compaction throughout the wetland and wetland buffer.

6.1.5 Nearshore Outfall

A submerged lake outfall was previously approved and a State Environmental Policy Act Mitigated Determination of Non-Significance (SEPA MDNS, SEP11-00005) was issued by the City of Issaquah. However, the previously approved submerged lake outfall did not reflect the most current regulations of allowable actions regarding stormwater facilities in lakes, nor did the submerged lake outfall feasibility assessments account for the actual bathymetry within this portion of the lake. A detailed evaluation of this previously approved submerged lake outfall concept identified the constraints of this outfall design, and alternatives were discussed with the Agencies. A Joint Agency Pre-Application meeting was held on 27 February 2019 to discuss the

outfall options. Based on recommendations by the stakeholders at this joint Agency meeting, the submerged outfall was discarded in favor of a nearshore outfall structure that would be located 10 feet upslope of the OHWM for Lake Sammamish.

The proposed nearshore outfall structure will consist of a bubble up system that will be placed above the OHWM of the lake consistent with WDFW guidance. Estimated peak flow rates will not exceed 11.6 cfs through this force main based on hydraulic models. The use of a new outfall into Lake Sammamish was previously determined to meet the Level 2 flow control requirements as outlined in the DA with the City of Issaquah. The proposed nearshore outfall configuration was determined to be less impactful to critical areas than the previously proposed submerged lake outfall for the following reasons:

- Coffer Dam has huge temp impact to sediments,
- Fish screen on the pipe is a nuisance hazard for recreation, and
- Shifting lakebed sediment would interfere with a submerged outfall.

Standard temporary construction sediment and flow control best management practices (BMPs) will be implemented during construction of the nearshore outfall.

6.2 Enhanced Stormwater Treatment

The proposed development will not provide additional water quality treatment since no new pollution generating surfaces are proposed as part of this project. Water quality treatment will be provided by subsequent developments prior to discharge to the proposed pump station. Treated stormwater will be dispersed appropriately between Tibbett's Creek and the nearshore outfall along Lake Sammamish. This system will effectively manage the risk of flooding over the current configuration.

6.3 Project Alternatives

Federal, State, and local guidelines require avoidance of critical area impacts, followed by minimization of impacts, then compensation for unavoidable impacts in some fashion consistent with the applicable regulations. More details on the mitigation sequencing for this Project are provided below in **Chapter 8.2**. As part of the mitigation sequencing process, the Project was evaluated for alternatives to the preferred option that is outlined in this report.

Evaluation of potential alternatives for the Hyla Crossing force main started several years ago with the submittal of materials that led to the issuance of a SEPA determination. That issued SEPA determination was for the construction of a submerged outfall structure within Lake Sammamish. In the intervening years, additional survey data was collected to be able to more accurately map the bathymetry within Lake Sammamish where the new outfall was proposed. The actual shoreline and lakebed drop-off was significantly more gradual than conceptual profiles previously identified. As a result of this additional survey, it was determined that the submerged outfall would need to be placed approximately 200 feet offshore from the lake OHWM. During the joint Agency pre-application meeting, several Agency staff noted that current state regulations make submerged stormwater outfalls incredibly challenging (to near impossible) to permit due to their invasive nature and high risk for causing impacts to lake resources and wildlife.

Other alternatives were evaluated to consider different locations of the outfall structure and use of a dispersion trench. These subsequent alternatives were each discarded for similar reasons – limited suitable area within which to work and challenges finding a viable path through all applicable environmental regulations.

Based on the above evaluations of potential pipeline alignments, different types of outfall structures, and different locations of the outfall structure, the most appropriate location for the proposed project is what is currently reflected as the Project.

CHAPTER 7. IMPACTS OF PROPOSED DEVELOPMENT

7.1 Assessment of Development Impacts

Both permanent and temporary wetland and buffer impacts are necessary to install and manage the pipeline and nearshore outfall (**Sheet W2.0** in **Appendix E**). Direct wetland and buffer impacts are anticipated for placement of the pipeline through Wetland E and maintenance of a maintenance easement, as well as for the outfall construction.

The total Project Area is 102,943 sf, of which approximately 6,333 sf of permanent wetland and buffer impacts and 58,574 sf of temporary wetland and buffer impacts, are anticipated for the pipeline and outfall installation. Permanent and temporary impact areas are summarized in the **Table 2** below.

Table 2. Summary of Critical Area Impacts

Feature ID	Permanent Wetland/Buffer Impacts	Temporary Wetland/Buffe Impacts	
Wetland A	0	0	
Wetland B	0	0	
Wetland C	0	0	
Wetland D	0	0	
Wetland E – outfall, pipeline/access trail	314 sf outfall 5,549 sf pipeline/trail 470 sf buffer	24,896 sf wetland 33,678 sf buffer	
Wetland F	0	0	
Tibbett's Creek Wetland	0	0	
Off-site WSDOT Swale (Linear Wetland)	0	0	
Tibbett's Creek	0	0	
Lake Sammamish	0	0	
TOTAL	6,333 sf	58,574 sf	

7.1.1 Pump Station

Construction of the pump station will occur outside of the buffer for Tibbett's Creek. However, the pump station is proposed within the mapped Tibbett's Creek flood plain. This will require placement of fill within the floodplain to bring the first floor finished elevation to the required 1-foot above the 100-year flood elevation. Flood storage compensation is required. Compensatory flood storage and a no-rise study is a requirement of the Flood Hazard Permit and was prepared by Watershed Science and Engineering and KPFF Consulting Engineers.

7.1.2 I-90 Force Main Crossing (Bore)

No impacts from the construction of the sending pit on south side of I-90 to critical areas are anticipated as a result of this utility bore underneath of I-90. The receiving pit on the north side of I-90 will temporarily impact Wetland E and its buffer.

7.1.3 NW Sammamish Rd Swale

The Project will be constructed at the edge of the NW Sammamish Road ROW, upslope of the Wetland E delineation. Temporary impacts to the buffer will result from pipe installation.

7.1.4 Pipeline Connecting Road to Outfall

The portion of the pipeline that connects the segment along NW Sammamish to the new nearshore outfall will cross Wetland E, triggering both permanent and temporary wetland impacts.

Permanent wetland and buffer impacts totally 6,333 sf are anticipated for the area of the pipeline itself, which will be maintained as an approximately 8-foot wide access trail along the entire length of the piped segment between the NW Sammamish Road ROW and the nearshore outfall. The access trail will tie into an existing pull-out along NW Sammamish Road. The trail will be a maintained trail consisting of arborist mulch that can be used by pedestrians or small utility vehicles to access the outfall structure. Long-term maintenance of this access trail may include mowing vegetation along the edge of the trail, monthly inspections during the growing season and during heavy rain events, and re-mulching the trail each year to maintain access.

Temporary wetland impacts are anticipated to accommodate construction activities through Wetland E. Approximately 24,896 sf of wetland and 33,678 sf of buffer will be temporarily impacted. These areas will be restored post-construction. The areas of temporary wetland and buffer impacts are dominated by reed canarygrass and will be restored by decompaction of soils after construction and plantings of native woody and herbaceous species.

7.1.5 Lake Sammamish Nearshore Outfall

The nearshore outfall will be placed approximately 10 feet upwards from the OHWM of Lake Sammamish, as directed by WDFW regulations. Access to the outfall will be provided by a mulch trail over the installed pipeline to minimize impacts to Wetland E. The outfall will consist of a grate inlet bubble up structure with an aluminum bolt down grate. Eight-inch round rock will be utilized to dissipate energy. The impacts associated with the nearshore outfall have been designed to minimize environmental impacts while still maintaining the intended purpose. This outfall will permanently impact approximately 314 sf of Wetland E for the construction of the outfall itself as well as the energy dissipation pad between the outfall and the OHWM of Lake Sammamish. No work is being proposed below the OHWM of Lake Sammamish, however, work will occur up to the OHWM.

The outfall design is expected to require minimal maintenance. Detailed documentation on the required maintenance for this outfall structure are provided in the civil-prepared documentation. Visual inspection of the outfall is expected to occur once monthly during the rainy season and after heavy rain events. Vegetation near the outfall and rock pad will be cleared biannually with hand trimmers.

7.2 Hydrology

No hydrologic impacts are expected to result to Lake Sammamish, Tibbett's Creek, or Wetland E as a result of this Project. Lake Sammamish is the receiving waterbody for regional stormwater for the greater Issaquah area, including the Hyla Crossing neighborhood, and this project will not change that. The stormwater discharges for the Hyla Crossing development flow into Tibbett's Creek in the existing condition, and the Project does not propose to change that. The project proposes to reduce the rate of stormwater discharge to Tibbett's Creek to achieve compliance with the required flow control standards.

No hydrologic impacts to any wetlands are anticipated as a result of this Project. Trench dams will be placed at regular intervals along the pipeline installed through Wetland E to ensure that the pipeline bedding does not act as a conduit for moving shallow groundwater. Appropriate soils will be used for backfilling the pipeline to ensure the proper installation of the pipeline while reducing impacts of the backfilled soil material on the lateral movement of shallow groundwater through Wetland E.

7.3 Floodplain Impacts

7.3.1 Flood Storage Compensation

The proposed Project will require the placement of fill into the Tibbett's Creek 100-year floodplain to accommodate the pump station. However, this Project will result in no loss of flood

storage once compensatory flood storage is provided in the adjacent compensatory storage area. Watershed Science and Engineering completed an evaluation of the proposed compensatory storage and concluded that the project will not result in a rise of the 100-year floodplain.

No regrading is proposed within the Greenwood Trust Property wetland. The Lake Sammamish force main and bubble up structure will be installed with the finished grade matching the existing grade. The Lake Sammamish 100-year floodplain will not be changed; therefore, compensatory flood storage analysis is not required.

7.3.2 Habitat Impact Assessment

Consistent with IMC Chapter 16.36.120.K.2, submittal of this report and supporting documentation to the Corps as part of the Nationwide Permitting process will require an ESA review. This Corps-directed ESA review will also serve as the habitat impact assessment, thus requiring no additional review through the City of Issaquah. A copy of the Corps Permit will be provided to the City upon receipt.

7.4 Assessment of Critical Habitats and Species Impacts

The USFWS and NMFS websites depict Federally-listed and proposed endangered and threatened species along with their associated critical habitat in Western Washington. These websites also indicate the presence of candidate species and species of concern. Also, the WDFW and StreamNet.org maintain databases of fish presence in rivers and streams in the Pacific Northwest.

No in-stream work is proposed as part of this Project. Standard erosion and sediment control measures will be used during construction to prevent any unintended impacts to the nearby wetlands, streams, or Lake Sammamish. Post-construction conditions are expected to maintain or improve upon the current conditions of Wetland E or Lake Sammamish within the Project Area.

No impacts to listed species are anticipated as a result of this Project. The Project would be reasonably expected to **not likely to adversely affect** Federally-listed species.

CHAPTER 8. PROPOSED MITIGATION

8.1 Agency Policies and Guidance

Mitigation for all critical area impacts must adhere to the policies and guidance for compensatory mitigation provided in the following documents:

- Issaquah Municipal Code, Chapter 18.10 -- Critical Areas;
- The Washington State Department of Ecology (DOE) Publication #06-06-011a, Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance (Version 1, March 2006), and DOE Publication #06-06-011b, Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Version 1, March 2006); and
- The Federal Compensatory Mitigation for Losses of Aquatic Resources Final Rule (33 CFR Parts 325 and 332, April 10, 2008), effective June 9, 2008.

The proposed mitigation plan is in accordance with IMC 18.10.720 Mitigating for wetland impacts. Mitigation sequencing was designed in accordance with the policies and guidance provided in WAC 173-26-201(2)(e) and IMC 18.10.490, per the Issaguah SMP Chapter 5.6.2.1.

Wetlands on the Site are subject to applicable State and Federal regulations. Wetland impacts are regulated at the Federal level by Sections 404 and 401 of the Clean Water Act. The US Army Corps of Engineers (USACE) is responsible for administering compliance with Section

404 via the issuance of Nationwide or Individual Permits for any fill or dredging activities within wetlands under Corps jurisdiction. Any project that is subject to Section 404 permitting is also required to comply with Section 401 Water Quality Certification, which is administered by the Washington State Department of Ecology (DOE).

8.2 Mitigation Sequencing

The demonstration of mitigation sequencing is required for approval of any site development plan that will impact critical areas or their associated buffers. Mitigation sequencing is described in IMC 18.10.490, which states:

<u>Mitigation Sequence:</u> Activities and development on sites containing critical areas shall follow the sequence of steps listed below in order of priority to further the goal of no net loss of ecological functions of environmental critical areas:

- 1. Avoid impacts altogether by not taking a certain action or parts of an action;
- 2. Minimize impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
- 3. Rectify impacts by repairing, rehabilitating or restoring the affected environment;
- 4. Compensate for the impact by replacing, restoring, creating, enhancing or providing substitute resources or environments;
- 5. Monitor the impact and the compensation projects and taking appropriate corrective measures.

Avoiding Impacts: The proposed site development plan has been designed to avoid impacts to Wetland E to the maximum extent practicable. Impacts to other wetlands and streams have been completely avoided. Wetland and priority upland impacts were generally avoided by proposing the pipeline route in the already disturbed NW Sammamish Rd Swale. Where critical area impacts could not be avoided, impacts were then minimized to the greatest extent possible.

Minimizing Impacts: The proposed site development plan reflects the minimum amount of impacts necessary to provide an economically viable development. The proposed Project Area was designed to minimize critical area impacts by directing the pipeline through areas already disturbed. Permanent impacts have been restricted to the width of the maintenance access trail over the installed pipeline, thus allowing for full restoration of all temporary impacts outside of this 8-foot width. A mulch trail will be used to provide maintenance access along the pipeline that will minimize impacts to habitat and wetland hydrology. Construction BMPs will be implemented to minimize soil compaction during construction, hydrologic disruptions due to the installed pipeline and backfill soils used, and sedimentation to the adjacent wetland and waterbodies.

Rectifying Impacts: All temporary impacts to Wetland E and its buffer will be restored.

<u>Compensating for Impacts</u>: Compensation for temporary wetland and buffer impacts will be mitigated through a combination of wetland and wetland buffer restoration and enhancement. Compensation for permanent wetland and buffer impacts will be provided through the purchase of credits at the Keller Farm Mitigation Bank at an approved ratio of 1:1 for Category III wetlands. While wetland creation is preferred per the IMC for the City, the Corps and WDOE require the use of mitigation banks over Permittee Responsible mitigation except where strong arguments support a different approach. Given the extensive wetlands already near the Project Area, and the proximity of the Keller Farm Mitigation Bank, it was determined that the mitigation bank was the best option to offset permanent wetland impacts.

<u>Monitoring for Impacts</u>: A monitoring program and contingency plan is provided in this report for the wetland restoration and enhancement areas that details the goals, objectives, and performance standards. The plan provides the post-construction performance monitoring schedule, including monitoring methods that will be used to evaluate the approved performance standards, as required under IMC 18.10.500.

8.3 Mitigation Site Selection

The regulatory agency policies for preferred type and location of compensatory mitigation differ in hierarchy between the agencies. The City of Issaquah under IMC §18.10.720 prefers the following site selection for location and timing of mitigation:

H. Location:

- 1. On-site compensation shall be provided except where the applicant can demonstrate that:
- 2. Off-site compensation shall occur within the same watershed as the wetland loss occurred.
- 3. In selecting compensation sites, applicants shall pursue siting in areas conducive to wetland creation, enhancement, or restoration based on recommendations of a wetland biologist and approved by the City.
- I. <u>Wetland Mitigation Banking:</u> The City may consider and approve replacement or enhancement of unavoidable adverse impacts to wetlands caused by development activities through an approved wetland mitigation bank, in advance of authorized impacts. Criteria governing the creation and use of a mitigation bank shall be established in administrative rules.

The Corps preferred sequence of mitigation site selection is as follows:

- Mitigation bank credits;
- 2. In-lieu fee program credits;
- 3. Permittee responsible mitigation under a watershed approach;
- 4. Permittee responsible mitigation on site and in kind; or
- 5. Permittee responsible mitigation off site and out-of-kind.

The City of Issaquah, under IMC §18.10.720(I) will consider the use of an approved wetland mitigation bank using criteria established in administrative rules. It is our understanding that there are no administrative rules currently in effect. In addition, the city does not have an allowance under their current code for the use of an In-lieu Fee program, such as the King County In-lieu Fee program, as well. Both the use of a wetland mitigation bank or an in-lieu fee program are the preferred methods for wetland impacts for the Federal Army Corps of Engineers.

The fundamental objective of the proposed compensatory mitigation plan is to offset environmental losses resulting from unavoidable impacts to waters of the U.S. Based upon the guidance in the above documents, all proposed mitigation shall be based on best available science and shall demonstrate no net loss of critical area functions and values.

8.4 Proposed Mitigation

To mitigate for permanent wetland and buffer impacts, we are proposing purchasing credits at the Keller Farm Mitigation Bank recently approved by the Interagency Review Team in December 2019. The purchase of credits through an approved mitigation bank is the preferred method of compensatory mitigation for federal agencies and will likely have a higher rate of success when compared to on-site wetland creation.

To mitigate for temporary wetland and buffer impacts for the pipeline construction, restoration is proposed. To mitigate for floodplain impacts, compensatory flood storage will be provided adjacent to the pump station in the buffer for Tibbett's Creek. Because the compensatory flood storage is located in the Tibbett's Creek Buffer, and as a future requirement of the DA between Rowley Properties, Inc. and the City of Issaquah, 0.6 acres of the Tibbett's Creek buffer will also be restored as part of this project. (Originally, this work was planned to be completed when one million SF was developed in the Hyla Crossing neighborhood. To date, less than 200,000 SF has been developed). Mitigation will include replacing existing impervious surface area with native soils and vegetation.

Therefore, final mitigation proposed for the Hyla Crossing Pumped Stormwater Discharge Project are as follows:

- Purchase credits at the KFMB for permanent wetland and buffer impacts;
- Restore 24,896 sf of temporary impacts to Wetland E;
- Restore 33,678 sf of temporary impacts to Wetland E buffer;
- Restore 26,194 sf of Tibbett's Creek buffer for both compensatory flood storage and previously agreed upon restoration per the DA

8.5 Mitigation Bank Credits

The project is within the service area of the Keller Farm Mitigation Bank (KFMB). This bank can provide the necessary compensatory mitigation in the form of mitigation bank credits to replace the functions and values lost by impacting Wetland E and its buffer. Coordination between KFMB and the City of Issaquah will ensure that credits purchased at the bank will adequately cover the mitigation requirements for on-site impacts. The Mitigation Banking Instrument (MBI) for KFMB provides guidance in determining the value of bank credits as a function of required mitigation ratios. Purchasing credits at a mitigation bank is an ideal mitigation solution for this project since the resulting mitigation area will provide higher levels of habitat function, and the operating structure of a mitigation bank ensures that all areas of mitigation will be monitored and maintained in perpetuity.

Mitigation required for the permanent impacts to Wetland E and its buffer will be provided by purchasing credits at KFMB using the Credits per Unit Impact ratios provided in the KFMB's Mitigation Banking Instrument (**Table 3**). A Mitigation Bank Credit is not a quantitative equivalent to the mitigation requirements for the City of Issaquah (i.e., one Mitigation Bank Credit does not purchase one acre of the mitigation bank). A credit represents a functional, or qualitative, equivalence to the proposed impacted resource and includes wetland creation/rehabilitation, associated critical areas buffer enhancements, and maintenance/monitoring costs associated with mitigation. Using KFMB for mitigation purposes requires that the Credits per Unit Impact ratio of the bank, as defined by the MBI, be used regardless of the mitigation requirements of the City of Issaquah. Units of impacts for wetlands are expressed in terms of acres. **Table 3** below describes the credit purchase ratios for KFMB.

Table 3. Keller Farm Mitigation Bank Credit Purchasing Ratios

Permanent Resource Impact	Credit to Impact Ratio
Wetland, Category I	Case by case
Wetland, Category II	1.2 to 1
Wetland, Category III	1.0 to 1
Wetland, Category IV	0.85 to 1
Critical Area Buffer	0.3 to 1
Stream	Case by case

A general bank use guidance document for the KFMB can be found in **Appendix D**. The guidelines contained in this document will be followed when determining the appropriate number of credits for mitigation bank compensation.

8.6 Mitigation Bank Benefits

The Washington Department of Ecology, by order of the State Legislature, has developed a set of draft mitigation banking regulations. The Legislature authorized DOE to start a mitigation bank pilot program to evaluate the draft rules. Many Federal, State, and local agencies recognize that mitigation banking can benefit the aquatic ecosystem, as well as permit applicants, regulatory and natural resource agencies, and the general public. To further promote the benefits of mitigation banking in meeting the "No Net Loss" policy of protecting wetlands, the US Army Corps of Engineers and the US Environmental Protection Agency issued a new rule on compensatory mitigation ("Compensatory Mitigation for Losses to Aquatic Resources", April 2008) prioritizing the use of mitigation bank credits for unavoidable impacts to aquatic resources.

Mitigation banks provide a financially and ecologically effective method for mitigating unavoidable impacts to aquatic resources. Mitigation banks are designed, monitored, and maintained through site-specific MBIs. The MBI provides a framework for the types of aquatic resources to be created or restored and specific performance standards that must be met. Performance standards include wetland hydrology, function, vegetative habitats, wildlife habitats, control of invasive species, and financial assurances for operation and protection in perpetuity. Banking credits are released as performance standards are met.

Ecological benefits of a mitigation bank are derived through the scale of the mitigation, the variety of habitats being created, the relatively high quality of habitats being created, the long-term monitoring and maintenance of the bank, and the permanent protection of the bank. An additional feature is that restoration or creation often has already occurred and is maturing before the credits are sold to a particular project. The large size of a mitigation bank also ensures connectivity between habitat types (wetland, stream, lakes-ponds, and upland) for wildlife.

By contrast, individual mitigations on development sites are typically much smaller, provide less habitat functioning and habitat types, and have severely time-limited maintenance and monitoring when compared to a mitigation bank. Development around critical areas disconnects the critical area from other habitat areas (wetlands or uplands), reducing the availability of that habitat to wildlife, while limiting the ability of wildlife existing in the wetland to migrate between habitat areas.

8.7 Wetland and Buffer Restoration

All temporary construction impacts will be fully restored following construction of the pipeline and outfall (**Sheet W3.0** in **Appendix E**). Soils will be restored and all areas will be planted with native species.

8.8 Floodplain Habitat and Storage Mitigation

Compensatory floodplain storage will be provided to mitigate for all fill material added to the Tibbett's Creek floodplain during the construction of the pump station. No re-grading is proposed with the construction of the Lake Sammamish force main or bubble up structure in the Greenwood Trust Property wetland, so compensatory floodplain storage in this area is not provided. Because the compensatory flood storage is located in the Tibbett's Creek Buffer, and as a requirement of the DA between Rowley Properties, Inc. and the City of Issaquah, 0.6 acres of the Tibbett's Creek buffer will be restored as part of this project (**Sheet W3.1** in **Appendix E**).

8.9 Mitigation Design Elements

The goal of the mitigation design is to restore critical area function from temporary and permanent impacts. Below is a description of how this will be accomplished, while meeting the design concepts described in **Chapter 6** above.

8.9.1 Removal of Non-native, Invasive Plant Species

Wetland E, near the proposed impact area, consists largely of reed canarygrass and Himalayan blackberry. Several ongoing restoration efforts are in place across the parcels, however, the invasive species are a significant problem for species diversity and habitat. The proposed mitigation plan will remove these non-native, invasive species and will aggressively control them throughout the required monitoring period to prevent their re-establishment.

8.9.2 Restoration Planting

Portions of Wetland E will be restored and enhanced by planting a variety of native trees, shrubs, and emergent vegetation. The goal of the mitigation planting plan is to increase the habitat services and values provided by Wetland E and its associated buffer. By extension, the enhancement and restoration planting proposed for Wetland E and its buffer will provide a beneficial habitat functional improvement for Wetland E (lake fringe wetland) and Lake Sammamish adjacent to the Project Area. The area is currently a monoculture of reed canarygrass providing limited wetland functions and values.

8.9.3 Planting Plan

Plant species were chosen for a variety of qualities, including: adaptation to specific water regimes, value to wildlife, value as a physical or visual barrier, pattern of growth (structural diversity), shading of stream channel, and aesthetic values. Native tree, shrub, and herbaceous species were chosen to increase both the structural and species diversity of the mitigation areas, thereby increasing the value of the area to wildlife for food and cover. See **Appendix E** - **Sheets W3.0 and W3.1** for a planting typicals.

We expect that seeds and berries from adjacent native species will be recruited by natural forces (wind, rain, birds) into the mitigation areas and will assist in achieving the performance standards for species diversity and cover. The performance standards limit the percentage cover of any single species of tree or shrub in the mitigation area. If a single native species becomes too prolific in naturally establishing itself in the mitigation area, its coverage will be reduced as required by the performance standards.

8.9.4 Mitigation Goals

The primary goal of the mitigation plan offset permanent wetland and buffer impacts by purchasing credits at the Keller Farm Mitigation Bank. The secondary goal is to restore all

temporary construction impacts after the pipeline is completed. To accomplish these goals, the proposed project will:

- Purchase credits at the KFMB for permanent wetland and buffer impacts;
- Restore 24,896 sf of temporary impacts to Wetland E;
- Restore 33,678 sf of temporary impacts to Wetland E buffer;
- Restore 26,194 sf of Tibbett's Creek buffer for both compensatory flood storage and previously agreed upon restoration per the DA

Mitigation objectives and performance standards will be provided upon receipt of preliminary agency comments. See **Section 10.2** for a full description of the monitoring methods that will be used to evaluate the approved performance standards. Mitigation monitoring will be performed by a qualified biologist.

CHAPTER 9. CONSTRUCTION SEQUENCING

9.1 Mitigation Construction Sequence

The following provides the general sequence of activities anticipated to be necessary to complete this mitigation project. Some of these activities may be conducted concurrently as the project progresses.

- 1. Conduct a site meeting between the Contractor, Talasaea Consultants, and the Owner's Representative to review the project plans, work areas, staging/stockpile areas, and material disposal areas.
- 2. Survey clearing/grading limits.
- 3. Flag existing trees and other vegetation near construction limits to ensure no unintentional damage occurs.
- 4. Install silt fencing, tree protection fencing (if required), and any other erosion and sedimentation control BMPs necessary for work in the project areas.
- 5. Complete installation of pipeline and other project elements.
- 6. Grub out invasive species in temporary wetland and wetland buffer impact areas simultaneously during installation.
- 7. Place topsoil or soil amendments as required.
- 8. Mulch all graded wetlands and wetland buffers impacted.
- 9. Construct mulch trail to access the outfall location for maintenance.
- 10. Complete site cleanup and install plant material as indicated on the planting plan.

9.2 Post-Construction Approval

Talasaea Consultants shall notify the permitting agencies (Corps, WDFW, WDOE, and City of Issaquah) when the mitigation planting is completed for a final site inspection and subsequent final approval. Once final approval is obtained in writing, the monitoring period will begin.

9.3 Post-Construction Assessment

Once construction is approved, a qualified wetland ecologist from Talasaea Consultants shall conduct a post-construction assessment. The purpose of this assessment will be to establish baseline conditions at Year 0 of the required monitoring period. A Baseline Assessment report including "as-built" drawings will be submitted to all of the required agencies. The as-built plan set will identify and describe any changes in grading, planting, or other constructed features in relation to the original approved plan.

CHAPTER 10.MONITORING PLAN

Performance monitoring of the mitigation areas will be conducted according to all applicable code/regulatory requirements and permit conditions. Monitoring will be conducted according to IMC 18.10.500 for a minimum of five (5) years for the City of Issaquah (City) and 10 years for the Army Corps of Engineers (Corps). Monitoring will be conducted according to the schedule presented in **Table 4** below, and will be performed by a qualified biologist or ecologist from Talasaea Consultants, Inc.

Table 4. Projected Schedule for Performance Monitoring and Maintenance Events

Year	Date	Maintenance Review	Performance Monitoring	Report Due to Agencies
Year 0, As-built and Baseline Assessment	Fall	X	X	Х
1	Spring	X	X	
	Fall	X	X	X
2	Spring	X	X	
	Fall	X	Χ	X
3	Spring	X		
	Fall	X	X	X
4	Spring	X		
	Fall	X	X	
5	Spring	X		
	Fall	X	X	X*
6	Spring	X		
	Fall			
7	Spring	X		
	Fall		X	X*
8	Spring	X		
	Fall			
9	Spring	X		
	Fall			
10	Spring	X		
	Fall	X	Х	X**

^{*}Obtain final approval to facilitate bond release from the City (presumes performance criteria are met).

10.1 Reports

The reports will include: 1) Project Overview, 2) Mitigation Requirements, 3) Summary Data, 4) Maps and Plans, and 5) Conclusions. If the performance criteria are met, monitoring for the City will cease at the end of year five, unless objectives are met at an earlier date and the City accepts the mitigation project as successfully completed.

10.2 Monitoring Methods

Vegetation monitoring methods may include counts; photo-points; random sampling; sampling plots, quadrats, or transects; stem density; visual inspection; and/or other methods deemed appropriate by the City and the biologist/ecologist. Vegetation monitoring components shall include general appearance, health, mortality, colonization rates, percent cover, percent survival, volunteer plant species, and invasive weed cover.

Permanent vegetation sampling plots, quadrats, and/or transects will be established at selected locations to adequately sample and represent all of the plant communities within the mitigation

^{**}Obtain final approval from the Corps (presumes performance criteria are met).

project areas. The number, exact size, and location of transects, sampling plots, and quadrats will be determined at the time of the baseline assessment.

Percent areal cover of woody vegetation (forested and/or scrub-shrub plant communities) will be evaluated through the use of point-intercept sampling methodology. Using this methodology, a tape will be extended between two permanent markers at each end of an established transect. Trees and shrubs intercepted by the tape will be identified, and the intercept distance recorded. Percent cover by species will then be calculated by adding the intercept distances and expressing them as a total proportion of the tape length.

The established vegetation sampling locations will be monitored and compared to the baseline data during each performance monitoring event to aid in determining the success of plant establishment. Percent survival of shrubs and trees will be evaluated in a 10-foot-wide strip along each established transect. The species and location of all shrubs and trees within this area will be recorded at the time of the baseline assessment and will be evaluated during each monitoring event to determine percent survival.

10.3 Photo Documentation

Locations will be established within the mitigation areas from which panoramic photographs will be taken throughout the monitoring period. These photographs will document general appearance and relative changes within the plant communities. Review of the photos over time will provide a semi-quantitative representation of the success of the planting plan. Vegetation sampling plot and photo-point locations will be shown on a map and submitted with the baseline assessment report and yearly performance monitoring reports.

10.4 Water Quality and Site Stability

Water quality will be assessed qualitatively, unless it is evident that there is a serious problem. In such an event, water quality samples will be taken and analyzed in a laboratory for suspected parameters. Qualitative assessments of water quality include:

- oil sheen or other surface films.
- abnormal color or odor of water.
- stressed or dead vegetation or aquatic fauna.
- turbidity, and
- absence of aquatic fauna.

Observations will be made of the general stability of soils in the mitigation areas during each monitoring event. Any erosion of soils or soil slumping will be recorded and corrective measures will be taken.

CHAPTER 11.MAINTENANCE AND CONTINGENCY

Regular maintenance reviews will be performed according to schedule presented in **Table 4** to address any conditions that could jeopardize the success of the mitigation project. Following maintenance reviews by the biologist or ecologist, required maintenance on the site will be implemented within ten (10) business days of submission of a maintenance memo to the maintenance contractor and permittee.

Established performance standards for the project will be compared to the yearly monitoring results to judge the success of the mitigation. If, during the course of the monitoring period, there appears to be a significant problem with achieving the performance standards, the permittee shall work with the City and other permitting agencies to develop a Contingency Plan in order to get the project back into compliance with the performance standards. Contingency plans can include, but are not limited to, the following actions: additional plant installation,

erosion control, bank stabilization, modifications to hydrology, and plant substitutions of type, size, quantity, and/or location. If required, a Contingency Plan shall be submitted to the City by December 31st of any year when deficiencies are discovered.

The following list includes examples of maintenance (M) and contingency (C) actions that may be implemented during the course of the monitoring period. This list is not intended to be exhaustive, and other actions may be implemented as deemed necessary.

- During year one, replace all dead woody plant material (M).
- Replace dead plants with the same species or a substitute that meets mitigation plan goals and objectives, subject to Talasaea and agency approval (C).
- Re-plant area after reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.) (C).
- After consulting with City staff and other permitting agencies, minor excavations, if deemed to be more beneficial to the existing conditions than currently exists, will be made to correct surface drainage patterns (C).
- Remove/control weedy or exotic invasive plants (e.g., Scot's broom, reed canarygrass, Himalayan blackberry, purple loosestrife, Japanese knotweed, etc.) by manual or chemical means approved by permitting agencies. Use of herbicides or pesticides within the mitigation area would only be implemented if other measures failed or were considered unlikely to be successful and would require prior agency approval. All nonnative vegetation must be removed and disposed of off-site. (C & M).
- Weed all trees and shrubs to the dripline and provide 3-inch deep mulch rings 24 inches in diameter for shrubs and 36 inches in diameter for trees (M).
- Remove trash and other debris from the mitigation areas twice a year (M).
- Selectively prune woody plants at the direction of Talasaea Consultants to meet the mitigation plan's goal and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs) (M).
- Repair or replace damaged structures including sign and fence (M).

CHAPTER 12.FINANCIAL GUARANTEE

Per IMC 18.10.490.D, the mitigation plan, separate from other aspects of the project on the Site, shall include financial guarantees, if necessary, to ensure that the mitigation plan is fully implemented; therefore, a bond may be issued for the work. The bond shall be in the amount of 150 percent of the estimated cost of the mitigation project for the length of the five (5) year monitoring period.

CHAPTER 13.SUMMARY

This report is the result of a critical areas study for the Hyla Crossing Pumped Stormwater Discharge Project Area. The Project is a linear utility that will construct a new force main (pipeline) starting at a new pump station south of Interstate 90 (I-90) and ending at a nearshore outfall to Lake Sammamish. The Project Area crosses several ownerships including Applicant-owned property, Sammamish Cove Park (public land), and several existing rights-of-way, including for I-90.

Hyla Crossing is an assemblage of already developed parcels on the south side of I-90. Before redevelopment is possible, engineered flow control must be implemented as part of the stormwater runoff design. The project proposes to construct a regional pump station, pipeline, and nearshore outfall to reduce the risk of flooding and eliminate the need for multiple individual detention systems and pump stations in the area. The proposed pipeline will start at the new pump station and end at the new outfall adjacent to Lake Sammamish. The future

redevelopment is outlined in the Rowley Development Agreement and the Hyla Crossing Master Drainage Plan.

Both permanent and temporary critical area impacts will occur between the proposed pump station and the nearshore outfall at Lake Sammamish. Permanent impacts to Wetland E include the new outfall structure and a 8-foot maintenance access trail over the proposed pipeline between NW Sammamish Road and the new outfall. Tibbett's Creek floodplain impacts will occur for the construction of the pump station south of I-90. Total permanent wetland and buffer impacts will be 6,333 sf. An additional 58,574 sf of temporary wetland and buffer impacts are anticipated to accommodate construction access and workspace during installation of the outfall and pipeline.

To mitigate for permanent wetland and buffer impacts, we are proposing purchasing credits at the Keller Farm Mitigation Bank (KFMB) recently approved by the Interagency Review Team (IRT) in December 2019. The service area of the bank includes the project area and is a viable alternative to wetland creation requirements if the City determines it to be an appropriate substitution.

To mitigate for temporary wetland and buffer impacts, restoration is proposed. To mitigate for floodplain impacts, compensatory flood storage will be provided adjacent to the pump station in the buffer for Tibbett's Creek. Because the compensatory flood storage is located in the Tibbett's Creek Buffer, and as a requirement of the DA between Rowley Properties, Inc. and the City of Issaguah, 0.6 acres of the Tibbett's Creek buffer will be restored as part of this project.

Restoration areas will be monitored for a minimum of five (5) years for the City of Issaquah (City) and 10 years for the Army Corps of Engineers (Corps).

CHAPTER 14. REFERENCES

- City of Issaquah. 2019. City of Issaquah Environmental Protection Chapter 18.10. Code Publishing Company.
- City of Issaquah. 2019. *City of Issaquah Shoreline Master Program.* Accessed 2019. https://www.issaquahwa.gov/index.aspx?nid=2958
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FIGURES



IMAGE SOURCE: GOOGLE MAPS, WWW.MAPS.GOOGLE.COM (ACCESSED 7 OCT 2019)

DRIVING DIRECTIONS:

- LEAVING FROM ISSAQUAH CITY HALL. HEAD EAST ON EAST SUNSET WAY TOWARD 2ND AVENUE NORTHEAST.
- 2. USE THE LEFT 2 LANDS TO TURN LEFT TO MERGE ONTO 1-90 WEST.
- 3. TAKE EXIT IS TOWARD WA-900 WEST/RENTON.
- 4. TURN RIGHT ONTO 17TH AVENUE NORTHWEST.
- 5. TURN LEFT ONTO NW SAMMAMISH ROAD.
- 6. ARRIVE AT DESTINATION:

5230 NM SAMMAMISH ROAD, ISSAQUAH, WASHINGTON 98027





15020 Bear Creek Road Northeast Woodinville, Washington 98077 Bus (425)861-7550 - Fax (425)861-7549 FIGURE #1

DESIGN	DRAWN	PROJEC'
A0	FH	1775
SCALE		
N.T.S.		
DATE	7	1 7
4-1-202	20	1 <u>/</u>
REVISED		

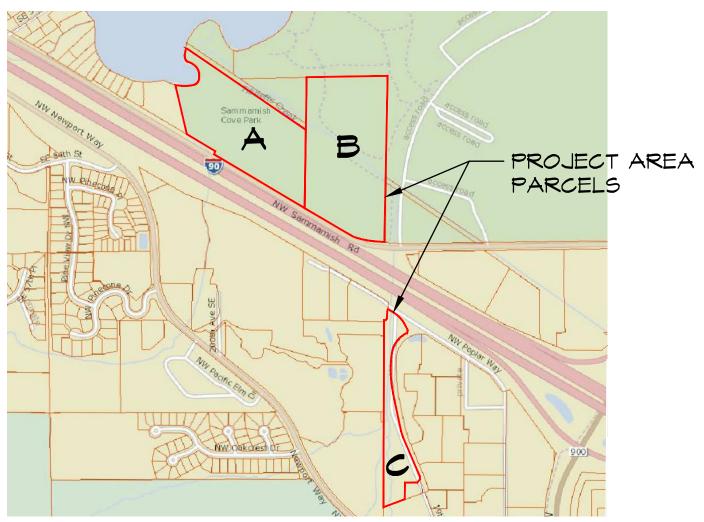


IMAGE SOURCE: KING COUNTY IMAP; HTTP://WWW5.KINGCOUNTY.GOV/IMAP/VIEWER.HTM?MAPSET=KCPROPERTY (ACCESSED 7 OCT 2019)

KEY	PARCEL
Α	2024069070
В	2024069079
С	356000140

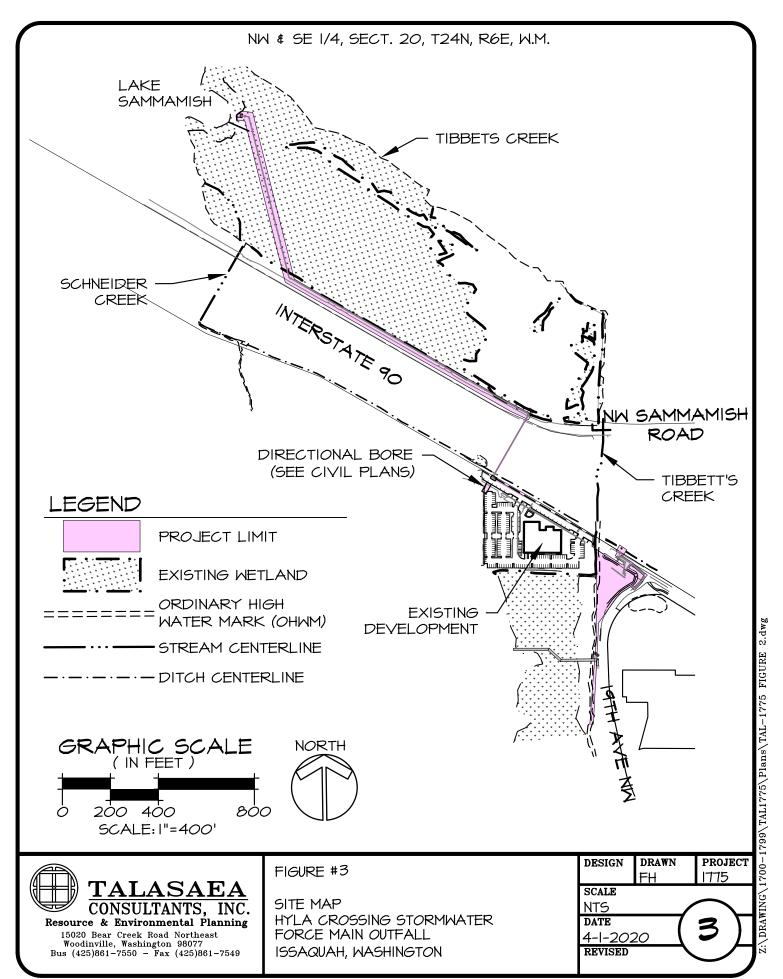


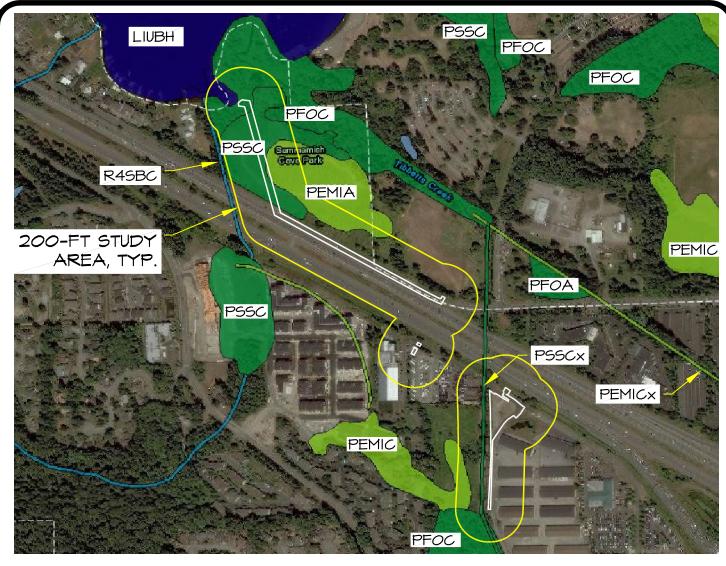
Z:\DRAWING\1700-1799\TAL1775\Plans\TAL-1775 Figures 2020-03.dwg



15020 Bear Creek Road Northeast Woodinville, Washington 98077 Bus (425)861-7550 - Fax (425)861-7549 FIGURE #2 PARCEL MAP

DESIGN	DRAWN	PROJECT
AO	FΗ	1775
SCALE		
N.T.S.		
DATE	7	
4-1-202	20 \	—)
REVISED		
		_





LEGEND

TYPE DESCRIPTION

LIUBH LACUSTRINE, LIMNETIC, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED

PFOC PALUSTRINE, FORESTED, SEASONALLY FLOODED
PSSC PALUSTRINE, SCRUB-SHRUB, SEASONALLY FLOODED.

PSSCX PLAUSTRINE, SCRUB-SHRUB, SEASONALLY FLOODED, EXCAVATED PEMIA PALUSTRINE, EMERGENT, PERSISTENT, TEMPORARY FLOODED. PEMIC PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED R4SBC RIVERINE, INTERMITTENT, STREAMBED, SEASONALLY FLOODED

SOURCE: U.S. FISH AND WILDLIFE SERVICE, (JAN 2015). NATIONAL WETLANDS

INVENTORY WEBSITE, U.S. DEPARTMENT OF THE INTERIOR, FISH AND

WILDLIFE SERVICE, WASHINGTON D.C.

http://www.fws.gov/wetlands/data/wetland-codes.html

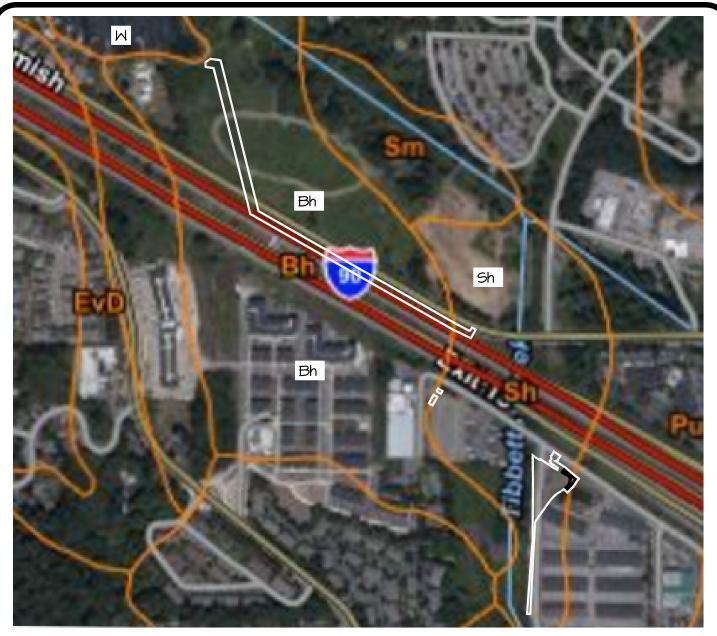




resource & Environmental Flaming 15020 Bear Creek Road Northeast Woodinville, Washington 98077 Bus (425)861-7550 - Fax (425)861-7549 FIGURE #4

NATIONAL WETLANDS INVENTORY MAP

DESIGN	DRAWN	PROJECT
A0	FH	1775
SCALE		
N.T.S.		
DATE	7	Λ
4-1-202	20 \	+)
REVISED	$\overline{}$	



LEGEND

TYPE DESCRIPTION, SLOPES
Bh BELLINGHAM SILT LOAM
Sh SAMMASMISH SILT LOAM

Sm SHALCAR MUCK

W WATER

SOURCE: SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION

SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, WEB SOIL SURVEY. AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/.

ACCESSED (10-07-2019).





15020 Bear Creek Road Northeast Woodinville, Washington 98077 Bus (425)861-7550 - Fax (425)861-7549 FIGURE #5 NRCS SOIL MAP

		li l
DESIGN	DRAWN	PROJECT
A0	FH	1775
SCALE		
N.T.S.		
DATE	7	
4-1-202	20	フ <u> </u>
REVISED	$\overline{}$	



IMAGE SOURCE: KING COUNTY IMAP; HTTP://WWW.KINGCOUNTY.GOV/IMAP/VIEWER.HTM?MAPSET=KCPROPERTY (ACCESSED 25 MARCH 2020)





15020 Bear Creek Road Northeast Woodinville, Washington 98077 Bus (425)861-7550 - Fax (425)861-7549 FIGURE #6

KING COUNTY CRITICAL AREAS MAP

DESIGN	DRAWN	PROJECT
AO	FΗ	1775
SCALE		
N.T.S.		
DATE	7	6
4-1-202	20 \	0
REVISED		

LEGEND

_	pa	rc	e	s
		-		_

Parcels

flood

Floodway

100 year Floodplain

IMAGE SOURCE: KING COUNTY IMAP; HTTPS://PRODUCTS.ISSAQUAHWA.GOV/ HTML5VIEWERPUBLIC/INDEX.HTML?VIEWER=ISSYPUBLIC (ACCESSED 27 MARCH 2020)





Resource & Environmental Planning

15020 Bear Creek Road Northeast Woodinville, Washington 98077 Bus (425)861-7550 - Fax (425)861-7549 FIGURE #7

CITY OF ISSAQUAH FLOODPLAIN MAP

DESIGN	DRAWN	PROJECT
A <i>O</i>	FH	1775
SCALE	_	
N.T.S.		
DATE	7	\rightarrow
4-1-202	20	
REVISED	$\overline{}$	

APPENDIX A

Wetland Delineation Data Sheets, Talasaea Consultants, 2019.

Project/Site: TAL 1775		City/C	n / King County Sampling Date: <u>03-30-</u>			20		
Applicant/Owner:							Point: TP-E	1
Investigator(s): A. Ellig				Section, To	wnship, Range: <u>NW-20-2</u>	24-6		
Landform (hillslope, terrace, etc.): Floodplain	ef (concave,	convex, none): Concave		_ Slope (%): <u>0</u>			
Subregion (LRR): A								
Soil Map Unit Name: Bellingham Silt Loam								
Are climatic / hydrologic conditions on the site typical for this								
Are Vegetation, Soil, or Hydrology sign	-				ormal Circumstances" pre		⊠ No □	
Are Vegetation, Soil, or Hydrology natu	-				•			
					ed, explain any answers i			
SUMMARY OF FINDINGS – Attach site map	showing	sam	ıplin	g point lo	ocations, transects	, importar	nt feature	es, etc.
Hydrophytic Vegetation Present? Yes ⊠ No □			Is th	e Sampled	Area			
Hydric Soil Present? Yes ⊠ No □				in a Wetlan		√ 0 □		
Wetland Hydrology Present? Yes ⊠ No □					· · · · · · · · · · · · · · · · · · ·			
Remarks:								
VEGETATION – Use scientific names of plan	te							
VEGETATION – Ose scientific flames of plan	Absolute	Dom	ninant	Indicator	Dominance Test work	ehoot:		
Tree Stratum (Plot size: 30')	% Cover				Number of Dominant S			
1. None	0				That Are OBL, FACW,	or FAC: 1		(A)
2.					Total Number of Domin	ant		
3.					Species Across All Stra			(B)
4.					Percent of Dominant S	necies		
Capling/Chruh Ctratum (Dlat aiza: 151)	0	= T	otal C	over	That Are OBL, FACW,		0	(A/B)
Sapling/Shrub Stratum (Plot size: 15')	0				Prevalence Index wor	ksheet:		
1. None					Total % Cover of:		lultiply by	
3.					OBL species			
4.	<u> </u>				FACW species			
5.					FAC species			
	0			·	FACU species			
Herb Stratum (Plot size: 5')					UPL species			
Phalaris arundinacea	100	<u>Y</u>		FACW	Column Totals:	(A)		(B)
2.					Due velene e la de v	- D/A -		
3.					Prevalence Index Hydrophytic Vegetation			
4					Dominance Test is		5:	
5.					☐ Prevalence Index is			
6.					☐ Morphological Adap		wide sunno	rtina
7.					data in Remarks			
8.	100		otal C	over	☐ Problematic Hydrop	hytic Vegeta	ition¹ (Expla	ain)
Woody Vine Stratum (Plot size: 15')	100	- 11	Olai C	ovei				
1. None					¹ Indicators of hydric soi	I and wetland	hydrology	must
2.					be present, unless distu	arbed or prob	lematic.	
	0	= To	otal C	over	Hydrophytic			
% Bare Ground in Herb Stratum % Cov	er of Biotic (Crust			Vegetation Present? Ye	s⊠ No□]	
Remarks: Hydrophytic vegetation criteria met.	. o. biolio (
, , ,								

Depth	cription: (Descr Matr	ix		Re	dox Featu			n uie absel	nce of indicators.)
(inches)	Color (moist)	%	Colo	r (moist)	%	Type ¹	_Loc ²	Texture	Remarks
0-7	10YR 3/3	100						<u>loam</u>	
<u>7-10</u>	10YR 4/2	80	7.5Y	R 4/4	20	<u>C</u>	M	sandy loar	m_
<u>10-18</u>	10YR 4/1	70	7.5Y	R 4/6	30	С	M	sandy loar	m
								-	
									
						·			
									2
	oncentration, D= Indicators: (Ap						ted Sand G		² Location: PL=Pore Lining, M=Matrix.
☐ Histosol		plicable to		Sandy Redox		oteu.)			2 cm Muck (A10)
	oipedon (A2)			Stripped Matr					led Parent Material (TF2)
☐ Black Hi	. ,			oamy Mucky	. ,	F1 (except	t MLRA 1))		/ery Shallow Dark Surface (TF12)
☐ Hydroge	en Sulfide (A4)			oamy Gleyed	l Matrix (F	2)		□0	other (Explain in Remarks
•	d Below Dark Sui	, ,		epleted Matr	` ,				
	ark Surface (A12)			Redox Dark S	•	•		21 11	
-	Mucky Mineral (S			Depleted Darl					cators of hydrophytic vegetation and
	Gleyed Matrix (S4	•)	□F	Redox Depres	ssions (Fe	3)			retland hydrology must be present, nless disturbed or problematic.
Restrictive	Layer (if presen	t):							, , , , , , , , , , , , , , , , , , ,
Type:									
Depth (in	nches):							Hydric S	Soil Present? Yes ⊠ No □
Remarks: H	ydric soil criteria	met.							
HYDROLO	GY								
	drology Indicate							_	
	cators (minimum	of one requ	uired; che						econdary Indicators (2 or more required)
⊠ Surfac	e Water (A1)			☐ Water-S4A, and 4E		eaves (B9)	(except ML	-RA 1, 2,	Water Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B))
	Vater Table (A2)			☐ Salt Cr	, ,				☐ Drainage Patterns (B10)
⊠ Satura	, ,			Aquation Aquation					☐ Dry-Season Water Table (C2)
	Marks (B1)			Hydrog					Saturation Visible on Aerial Imagery (C9
	ent Deposits (B2))		Oxidize			-	oots (C3)	Geomorphic Position (D2)
	eposits (B3)			Presen		•	,	20)	Shallow Aquitard (D3)
_	Mat or Crust (B4)			Recent			,	•	FAC-Neutral Test (D5)
	eposits (B5)	2)		☐ Stunted		sed Plants Remarks)		4)	Raised Ant Mounds (D6(LRR A) Frost-Heave Hummocks (D7)
	e Soil Cracks (B6		· (DZ)	☐ Other (⊏хµіаіі іі і	Remarks)			Frost-neave numinocks (D1)
	tion Visible on Ae								
Field Obser	ly Vegetated Cor	icave Suria	ce (B8)						
		Vaa M	No 🗆	Donth (inch					
	ter Present?	Yes ⊠	No 🗆	Depth (inch					
Water Table		Yes ⊠	No 🗆	Depth (inch			18/-4	land Useder	Jony Present? Ves M No D
Saturation F (includes ca	resent? pillary fringe)	Yes ⊠	No 🗌	Depth (inch	ies):		wet	iand Hydro	logy Present? Yes ⊠ No □
	ecorded Data (str	eam gauge	, monitor	ing well, aeria	al photos,	previous ir	spections)	, if available:	:
Dame I 11	(-HI b- 1		4						
Remarks: W	etland hydrology	criteria me	τ.						

Project/Site: TAL 1775		City/C	County	: <u>Issaquah</u>	/ King County	3-30-20			
Applicant/Owner:					State: WA	Sampling Point: ⁻	TP-E2		
Investigator(s): A. Ellig Section, Township, Range: NW-20-24-6									
Landform (hillslope, terrace, etc.): Floodplain		Loca	al relie	f (concave,	convex, none): None	Slop	oe (%): <u>0</u>		
Subregion (LRR): A	Lat: 47.5	53016	3		Long:122.069886	Datum	n: <u>WGS84</u>		
Soil Map Unit Name: Bellingham Silt Loam					NWI classific	cation: None			
Are climatic / hydrologic conditions on the site typical for this									
Are Vegetation, Soil, or Hydrology sign	-				ormal Circumstances" pre		οП		
Are Vegetation, Soil, or Hydrology natu	-				ed, explain any answers	_	_		
SUMMARY OF FINDINGS – Attach site map							atures etc		
	Silowing	Juin	<u> </u>	g point it	Journal of transcott	s, important roc	itures, etc.		
Hydrophytic Vegetation Present? Yes ⊠ No ☐ Hydric Soil Present? Yes ☐ No ☒			Is the	e Sampled	Area				
Wetland Hydrology Present? Yes ⊠ No □			withi	n a Wetlan	nd? Yes 🗌 🗆	No 🖾			
Remarks:									
VEGETATION – Use scientific names of plan	ts.								
Total Objectives (Plat sizes 000)	Absolute				Dominance Test worl	ksheet:			
Tree Stratum (Plot size: 30') 1. None	% Cover				Number of Dominant S That Are OBL, FACW,		(A)		
		,			mat Ale OBL, I ACVV,	011AC. <u>1</u>	(A)		
3.					Total Number of Domir Species Across All Stra		(B)		
4.							(5)		
	0				Percent of Dominant S That Are OBL, FACW,		(A/B)		
Sapling/Shrub Stratum (Plot size: 15')									
1. None					Prevalence Index wo	rksneet: Multiply	bv.		
2					OBL species				
3. 4.					FACW species				
5.					FAC species				
	0				FACU species				
Herb Stratum (Plot size: 5')					UPL species	x 5 =			
1. Taraxacum sp.	<u>5</u>			FAC	Column Totals:	(A)	(B)		
2. Plantago lanceolata				FACU_	Prevalence Index	x = B/A =			
3. Fescuta rubra				FAC NII	Hydrophytic Vegetati				
4. <i>Trifolium sp.</i> 5.					□ Dominance Test is				
6.					☐ Prevalence Index is	s ≤3.0¹			
7.					☐ Morphological Ada				
8						s or on a separate s	,		
	100	= To	otal Co	over	☐ Problematic Hydro	pnytic vegetation (Explain)		
Woody Vine Stratum (Plot size: 15')					¹ Indicators of hydric so	oil and wetland hydro	nlogy must		
1. None					be present, unless dist				
2.	0	= To	otal Co	over	Hydrophytic	-			
W.B. 0 11 11 1 2 1					Vegetation	no ⊠ No □			
	er of Biotic (_rust			Present? Ye	es 🛛 No 🗌			
Remarks: Hydrophytic vegetation criteria met.									

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)									
Depth	Matrix			Redo	x Feature				
(inches)	Color (moist)	<u>%</u>	Colo	r (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-5	10YR 3/3	100			_			loam	
5-14	10YR 4/4	100						loam	coarse gravel
<u> </u>	-								
					_				
	_					-			
	oncentration, D=De						ed Sand G		Location: PL=Pore Lining, M=Matrix.
_	Indicators: (Appl	icable to				ed.)			ators for Problematic Hydric Soils ³ :
Histosol	` '			Sandy Redox (cm Muck (A10)
	pipedon (A2)			Stripped Matrix					ed Parent Material (TF2)
☐ Black His				oamy Mucky N			MLRA 1))		ery Shallow Dark Surface (TF12)
	n Sulfide (A4)	00 (411)		oamy Gleyed Nepleted Matrix				□Ot	her (Explain in Remarks
	d Below Dark Surfa ark Surface (A12)	ce (ATT)		Redox Dark Su	` '				
	lucky Mineral (S1)			Depleted Dark		7)		3Indic	ators of hydrophytic vegetation and
_	leyed Matrix (S4)			Redox Depress	`	.,			etland hydrology must be present,
	,				()				lless disturbed or problematic.
Restrictive	Layer (if present):								·
Type:	,								
	ches):							Hydric S	oil Present? Yes □ No ⊠
	ydric soil criteria no		_					- ilyano o	
Remarks. Hy	yunc son cinteria no	t met.							
HYDROLO	GY								
Wetland Hv	drology Indicators	s:							
	cators (minimum of		ired: che	eck all that ann	lv)			Se	condary Indicators (2 or more required)
	e Water (A1)	Ono roqu	irou, orie	☐ Water-St	•	es (RQ) (vcent MI		☐ Water Stained Leaves (B9) (MLRA 1, 2,
Surface	e water (AT)			4A, and 4B)		(63 (13)	skeept ML		4A, and 4B))
	ater Table (A2)			☐ Salt Crus	st (B11)				☐ Drainage Patterns (B10)
				☐ Aquatic I	nvertebrat	es (B13)			☐ Dry-Season Water Table (C2)
☐ Water I				☐ Hydroge	n Sulfide C	Odor (C1)			☐ Saturation Visible on Aerial Imagery (C9)
☐ Sedime	ent Deposits (B2)			☐ Oxidized	Rhizosph	eres along	g Living Ro	oots (C3)	☐ Geomorphic Position (D2)
☐ Drift De	eposits (B3)			☐ Presence	e of Reduc	ed Iron (C	24)		☐ Shallow Aquitard (D3)
☐ Algal M	lat or Crust (B4)			☐ Recent I	on Reduc	tion in Till	ed Soils (C	26)	☐ FAC-Neutral Test (D5)
☐ Iron De	eposits (B5)			☐ Stunted	or Stresse	d Plants (D1)(LRR A	A)	☐ Raised Ant Mounds (D6(LRR A)
☐ Surface	e Soil Cracks (B6)			☐ Other (E	xplain in R	emarks)			☐Frost-Heave Hummocks (D7)
☐ Inundat	ion Visible on Aeria	al Imagery	(B7)						
	y Vegetated Conca		` '						
Field Obser			(20)				1		
Surface Wat		V00 🏻	No M	Donth (incho	2).				
			No ⊠	Depth (inche					
Water Table			No 🗆	Depth (inche					
Saturation P	resent? pillary fringe)	Yes ⊠	No 🗌	Depth (inche	s): <u>6"</u>		Weti	and Hydrol	ogy Present? Yes ⊠ No □
	corded Data (strea	m gauge.	monitori	ing well, aerial	photos, pr	evious ins	spections).	if available:	
	,	,		-			. "		
Remarks: W	etland hydrology cr	riteria met	_						

Project/Site: TAL 1775	(City/C	ounty: Issaqua	ah / King County	Sampling Date:	03-30-20
Applicant/Owner:	State: WA Sampling Point: 1					TP-E3
Investigator(s): A. Ellig			Section,	Township, Range: <u>NW-20</u>)-24-6	
Landform (hillslope, terrace, etc.): Floodplain		Loca	ıl relief (conca	ve, convex, none): Concav	<u>ve</u> Slo	pe (%): <u>0</u>
Subregion (LRR): A						
Soil Map Unit Name: Bellingham Silt Loam						
Are climatic / hydrologic conditions on the site typical for this						
Are Vegetation, Soil, or Hydrology sign	-			Normal Circumstances" pr		do □
Are Vegetation, Soil, or Hydrology natu	-			eded, explain any answers	_	10 🗀
SUMMARY OF FINDINGS – Attach site map	showing	sam	pling point	locations, transect	s, important fe	atures, etc.
Hydrophytic Vegetation Present? Yes ⊠ No □			Is the Sample	ed Area		
Hydric Soil Present? Yes ⊠ No □			within a Wet		No 🗌	
Wetland Hydrology Present? Yes ⊠ No □						
Remarks:						
VEGETATION – Use scientific names of plan	te					
VEGETATION – Ose scientific flames of plan		Dom	inant Indicato	r Dominance Test wo	rkehoot:	
Tree Stratum (Plot size: 30')			cies? Status			
1. None	0				/, or FAC: 1	(A)
2.				Total Number of Dom	inant	
3.						(B)
4.				Percent of Dominant	Species	
Sapling/Shrub Stratum (Plot size: 15')	0	= To	otal Cover	That Are OBL, FACW		(A/B)
1. None	0			Prevalence Index wo	orksheet:	
2.				T-4-10/ O	: Multipl	y by:
3.				OBL species		
4.				EACIA/ ====i==		
5.				FAC species		
	0			FACU species	x 4 =	
Herb Stratum (Plot size: 5')				UPL species		
Phalaris arundinacea	100	<u>Y</u>	FACW	Column Totals:		(B)
2						
3.					ex = B/A =	
4.				Hydrophytic Vegetat		
5				☐ Dominance Test i		
6.				☐ Prevalence Index		
7.		-		Morphological Ada	rks or on a separate	
8				☐ Problematic Hydro	·	•
Woody Vine Stratum (Plot size: 15')	100	= Tc	otal Cover			
1. None				¹ Indicators of hydric s	oil and wetland hyd	rology must
2.				be present, unless dis	sturbed or problema	tic.
	0	= Tc	otal Cover	Hydrophytic		
0/ Para Cround in Harb Stratum				Vegetation Present? Y	∕es ⊠ No □	
% Bare Ground in Herb Stratum % Cover Remarks: Hydrophytic vegetation criteria met.	er of Biotic C	Just _		i resent:		
Tremains. Hydrophytic vegetation criteria met.						

Depth	Matr	ix			dox Featu			ii uie ause	nce of indicators.)
(inches)	Color (moist)	%	Colo	r (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4	10YR 3/2	90	10YF	R 4/4	10	С	M	loam	
<u>5-18</u>	10YR 5/1	80	<u>10YF</u>	R 4/6	20	<u>C</u>	<u>M</u>	<u>loam</u>	
			_						
							·		
			_						_
			_			_			
							·	-	
	oncentration, D= Indicators: (Ap						ted Sand G		² Location: PL=Pore Lining, M=Matrix. cators for Problematic Hydric Soils ³ :
☐ Histosol		piicable to		Sandy Redox		oteu.)			2 cm Muck (A10)
	oipedon (A2)			Stripped Matr					Red Parent Material (TF2)
	istic (A3)			oamy Mucky	, ,	F1 (excep	t MLRA 1))		Very Shallow Dark Surface (TF12)
☐ Hydroge	en Sulfide (A4)			oamy Gleyed					Other (Explain in Remarks
	d Below Dark Sui	, ,		epleted Matr	` ,				
	ark Surface (A12)			Redox Dark S	•			2	
	Mucky Mineral (S [.] Gleyed Matrix (S4			Depleted Darl Redox Depres		• •			icators of hydrophytic vegetation and vetland hydrology must be present,
	sieyeu Matrix (34)		redux Depres	5510115 (FC	·)			ınless disturbed or problematic.
Restrictive	Layer (if presen	t):							, , , , , , , , , , , , , , , , , , ,
Depth (in	nches):							Hydric	Soil Present? Yes ⊠ No □
Remarks: H	ydric soil criteria	met.							
HYDROLC	GY								
Wetland Hy	drology Indicate	ors:							
Primary Indi	cators (minimum	of one requ	uired; che	eck all that ap	ply)			S	econdary Indicators (2 or more required)
Surface Surface	e Water (A1)			☐ Water-S 4A, and 4E		eaves (B9)	(except ML	.RA 1, 2,	☐ Water Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B))
	Vater Table (A2)			☐ Salt Cr	ust (B11)				☐ Drainage Patterns (B10)
	tion (A3)			☐ Aquatio	Inverteb	rates (B13)	1		☐ Dry-Season Water Table (C2)
☐ Water	Marks (B1)			☐ Hydrog	en Sulfide	e Odor (C1)		☐ Saturation Visible on Aerial Imagery (C9)
☐ Sedim	ent Deposits (B2))		☐ Oxidize	d Rhizos	pheres alor	ng Living Ro	oots (C3)	⊠ Geomorphic Position (D2)
	eposits (B3)			Presen			,		Shallow Aquitard (D3)
_	Mat or Crust (B4)			Recent			,	•	FAC-Neutral Test (D5)
	eposits (B5)			Stunted				A)	Raised Ant Mounds (D6(LRR A)
	e Soil Cracks (B6			☐ Other (Explain in	Remarks)			☐Frost-Heave Hummocks (D7)
	tion Visible on Ae								
	ly Vegetated Cor	icave Surfa	ce (B8)				1		
Field Obser		Vaa M	No 🗆	Donth (inch					
	ter Present?	Yes ⊠	No 🗆	Depth (inch					
Water Table		Yes ⊠	No 🗆	Depth (inch			18/04	land Uvdra	ology Brosent2 Vec M No 🗆
Saturation F (includes ca	resent? pillary fringe)	Yes ⊠	No 🗌	Depth (inch	es):		wet	iano Hyoro	ology Present? Yes ⊠ No □
	ecorded Data (str	eam gauge	, monitor	ng well, aeria	al photos,	previous ir	nspections).	, if available	9 :
Remarks: W	etland hydrology	criteria me	t						

Applicant/Owner	Project/Site: TAL 1775		City/C	ounty	: <u>Issaquah</u>	/ King County	Sampling Date: 03-30-20
Local relief (concave, correx, none): None	Applicant/Owner:					State: WA	Sampling Point: TP-E4
Soli May Unit Name Bellingham Silt Loam	Investigator(s): A. Ellig				Section, To	wnship, Range: <u>NW-20-24</u>	I-6
Soil Map Unit Name: Betilingham Silt Loam	Landform (hillslope, terrace, etc.): Floodplain		Loca	l relie	f (concave,	convex, none): None	Slope (%): <u>0</u>
Are Vegetation Soil or Hydrology significantly disturbed?	Subregion (LRR): A	_ Lat: <u>47.5</u>	53526	1		Long: <u>-122.070098</u>	Datum: WGS84
Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present?	Soil Map Unit Name: Bellingham Silt Loam					NWI classificat	tion: None
Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present?	Are climatic / hydrologic conditions on the site typical for this	time of yea	ır? Ye	es 🛛	No ☐ (If	no, explain in Remarks.)	
Are Vegetation	Are Vegetation, Soil, or Hydrology sign	nificantly dist	turbed	1?	Are "No	rmal Circumstances" pres	ent? Yes ⊠ No □
SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present?	Are Vegetation, Soil, or Hydrology natu	rally probler	natic?	•	(If neede	ed, explain any answers in	Remarks.)
Hydrophytic Vegetation Present? Yes							
Hydric Soil Present?		<u> </u>		. ,	, ,	, , , , , , , , , , , , , , , , , , , ,	
Wetland Hydrology Present? Yes ☑ No ☐ Wittlin a wetland? Yes ☑ No ☑ Remarks: VEGETATION – Use scientific names of plants. Tree Stratum (Plot size: 30') Absolute Stratum (Indicator Species? Status Species? Status Species? Status Species Arcs Arc Species? Status Species Arcs Arc Species Arc Arc Arc Arc Arc Arc					•		_
Tree Stratum (Plot size: 30')				withi	n a Wetlan	id? Yes ☐ No) <u> </u>
Absolute Dominant Indicator % Cover Species? Status 1. None 0 0	Remarks:						
Absolute							
Absolute Dominant Indicator % Cover Species? Status 1. None 0 0							
Tree Stratum (Plot size: 30')	VEGETATION – Use scientific names of plant						
1. None	Tree Stratum (Plot size: 30')						
2. 3.							
3.						Total Number of Domina	int
Sapling/Shrub Stratum (Plot size: 15') 1. None	3.						
Sapling/Shrub Stratum (Plot size: 15') 1. None	4.					Percent of Dominant Spe	ecies
1. None	Sapling/Shrub Stratum (Plot size: 15')	0	= To	otal Co	over		
2.	`	0				Prevalence Index work	sheet:
FACW species x 2 = FAC species x 3 = FACU species x 3 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 = FACU species x 5 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 4 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 4 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 = TACU species x 4 = TACU species x 4 = TACU species x 5 = TACU species x 5 = TACU species x 4 = TACU species x 5 =						Total % Cover of:	Multiply by:
FAC species x 3 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 = FACU species x 4 = FACU species x 5 =	3.					OBL species	x 1 =
Herb Stratum (Plot size: 5') 1. Hypochaeris radicata	4.						
Herb Stratum (Plot size: 5') 1. Hypochaeris radicata	5.						
1. Hypochaeris radicata 10 N FACU 2. Phalaris arundinacea 5 N FACW 3. Fescuta rubra 85 Y FAC 4. Hydrophytic Vegetation Indicators: 5. Dominance Test is >50% 6. Prevalence Index is ≤3.0¹ 7. Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) 9. Problematic Hydrophytic Vegetation¹ (Explain) 1. None Problematic Hydrophytic vegetation¹ (Explain) 1. None Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Wegetation Hydrophytic Vegetation Yes No □	Herh Stratum (Plot size: 5')	0	= To	otal Co	over		
2. Phalaris arundinacea 5 N FACW 3. Fescuta rubra 85 Y FAC 4.		10	N		FACU		
3. Fescuta rubra						Column Totals:	(A) (B)
5.						Prevalence Index	= B/A =
6. 7. 8. Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) Monday Vine Stratum (Plot size: 15') None	4.						
7. 8. Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 1. None	5					-	
8 data in Remarks or on a separate sheet) Woody Vine Stratum (Plot size: 15') 1. None 1Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 1. Woody Vine Stratum							
Moody Vine Stratum (Plot size: 15') 1. None 2.							
Woody Vine Stratum (Plot size: 15') 1. None	8.					☐ Problematic Hydroph	nytic Vegetation¹ (Explain)
2 be present, unless disturbed or problematic. Hydrophytic We Bare Ground in Herb Stratum % Cover of Biotic Crust Present? Yes 🗵 No 🗆	Woody Vine Stratum (Plot size: 15')	100	= 10	otal Co	over		
2 = Total Cover Wegetation Present? Yes ☑ No ☐	1. None						
% Bare Ground in Herb Stratum % Cover of Biotic Crust	2.					' '	bed of problematic.
% Bare Ground in Herb Stratum % Cover of Biotic Crust Present? Yes ⊠ No □		0	= To	otal Co	over		
Remarks: Hydrophytic vegetation criteria met.	% Bare Ground in Herb Stratum % Cove	er of Biotic C	Crust _				⊠ No □
	Remarks: Hydrophytic vegetation criteria met.						

Profile Desc	cription: (Describ	e to the c	lepth nee	eded to docu	ment the	indicator	or confirn	n the absend	ce of indicators.)
Depth	Matrix			Red	ox Feature				
(inches)	Color (moist)	%	Color	(moist)	%	Type ¹	Loc ²	Texture	Remarks
0-10	10YR 3/3	100						loam	
10-16	10YR 3/3	90	10YR	4/4				loam	coarse gravel
-	-				<u> </u>				
								-	<u> </u>
	oncentration, D=De						ed Sand G		ocation: PL=Pore Lining, M=Matrix.
_	Indicators: (Appl	icable to				ed.)			tors for Problematic Hydric Soils ³ :
Histosol	` '			andy Redox (cm Muck (A10)
	oipedon (A2)			ripped Matrix		. ,			d Parent Material (TF2)
☐ Black Hi				amy Mucky		-	MLRA 1))		ery Shallow Dark Surface (TF12)
	n Sulfide (A4) d Below Dark Surfa	00 (111)		amy Gleyed				☐ Oth	ner (Explain in Remarks
	ark Surface (A12)	ce (ATT)		pleted Matrix edox Dark Su					
	fucky Mineral (S1)			epleted Dark	, ,	7)		3Indica	ators of hydrophytic vegetation and
_	Gleyed Matrix (S4)			edox Depres	•	.,			tland hydrology must be present,
	, ,		_		(. ,				ess disturbed or problematic.
Restrictive	Layer (if present):								·
Type:	, , ,								
Depth (in	ches):							Hydric So	oil Present? Yes □ No ⊠
	ydric soil criteria no	t mot						Tiyano o	on resent.
Remarks. H	yunc son cinena no	ı met.							
HYDROLO	GY								
Wetland Hv	drology Indicator	s:							
	cators (minimum of		ired: che	k all that and	oly)			Sec	condary Indicators (2 or more required)
	e Water (A1)	Ono roqu	1100, 0110	☐ Water-St	•	/AS (RQ) (excent MI		☐ Water Stained Leaves (B9) (MLRA 1, 2,
Surface	e water (AT)			4A, and 4B)		/es (Da) (skeept wil		4A, and 4B))
☐ High W	/ater Table (A2)			☐ Salt Cru	st (B11)			[☐ Drainage Patterns (B10)
				☐ Aquatic	Invertebrat	es (B13)		[☐ Dry-Season Water Table (C2)
	Marks (B1)			Hydroge	n Sulfide (Odor (C1)		[☐ Saturation Visible on Aerial Imagery (C9)
☐ Sedime	ent Deposits (B2)			Oxidized	d Rhizosph	eres alon	g Living Ro	oots (C3)	Geomorphic Position (D2)
☐ Drift De	eposits (B3)			Presenc	e of Reduc	ed Iron (0	C4)	[☐ Shallow Aquitard (D3)
☐ Algal M	Mat or Crust (B4)			☐ Recent I	ron Reduc	tion in Till	ed Soils (C	(6)	☐ FAC-Neutral Test (D5)
☐ Iron De	eposits (B5)			☐ Stunted	or Stresse	d Plants (D1)(LRR A	(<i>A</i>)	Raised Ant Mounds (D6(LRR A)
☐ Surface	e Soil Cracks (B6)			☐ Other (E	xplain in R	emarks)		[☐Frost-Heave Hummocks (D7)
☐ Inundat	ion Visible on Aeria	al Imagery	(B7)						
	ly Vegetated Conca		` '						
Field Obser			(20)						
Surface Wat		Yes 🗌	No 🛛	Depth (inche	ve).				
				. ,					
Water Table			No 🗌	Depth (inche			14/-4/		
Saturation P	resent? pillary fringe)	Yes ⊠	No 🗌	Depth (inche	es): <u>5"</u>		weti	and Hydroid	ogy Present? Yes ⊠ No □
	corded Data (strea	m gauge,	monitorir	ıg well, aerial	photos, pr	evious ins	spections),	if available:	
					•		,		
Remarks: W	etland hydrology c	riteria met							
	, : -:- <u>-</u>								

APPENDIX B

Wetland Rating Forms, Washington State Department of Ecology Wetland Rating System for Western Washington (2014), Talasaea Consultants, 2019.

	NG SUM				
					site visit: $10/8/18$ o Date of training $4/2$
HGM Class used fo	r rating Depr	essional	Wetland has m	ultiple HGN	1 classes?YN
	is not complet f base aerial pho				can be combined).
VERALL WETLA	ND CATEGO	RY (ba	sed on functio	nsor sp	ecial characteristics
1. Category of v	vetland based Category I – Tot				
	Category II – To				Score for each function based on three ratings
(Category IV – To	otal score = 9 -	15		(order of ratings is not
FUNCTION	Improving Water Quality	Hydrologic	Habitat propriate ratings		important) 9 = H,H,H
Site Potential	H (M) L	H M. D	H M (L)		8 = H,H,M 7 = H,H,L
Landscape Potential	H_M L	H W L	H M (L)		7 = H,M,M
Value	H M L	H) M L	H M L	TOTAL	6 = H,M,L
Score Based on Ratings	7	le	5	18	6 = M,M,M 5 = H,L,L 5 = M,M,L
					4 = M,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CAT	EGORY
Estuarine	ı I	II
Wetland of High Conservation Value		I
Bog	I	
Mature Forest		I
Old Growth Forest		I
Coastal Lagoon	I	II
Interdunal	I II	III IV
None of the above		

3 = L,L,L

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1.	Are the water levels in	the entire unit usually controlled by tides except during floods?
	NO - go to 2	YES – the wetland class is Tidal Fringe – go to 1.1
1	1.1 Is the salinity of the v	water during periods of annual low flow below 0.5 ppt (parts per thousand)?
	🖟 If your wetland can b	Al Fringe (Estuarine) e classified as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If i nge it is an Estuarine wetland and is not scored. This method cannot be used to tuarine wetlands.
2.		it is flat and precipitation is the only source (>90%) of water to it. Groundwate off are NOT sources of water to the unit.
	NO – go to 3 If your wetland can be	YES – The wetland class is Flats classified as a Flats wetland, use the form for Depressional wetlands.
3.	The vegetated part of plants on the surfac	nd unit meet all of the following criteria? of the wetland is on the shores of a body of permanent open water (without any e at any time of the year) at least 20 ac (8 ha) in size; open water area is deeper than 6.6 ft (2 m).
	NO – go to 4	YES - The wetland class is Lake Fringe (Lacustrine Fringe)
4.	The wetland is on aThe water flows the seeps. It may flow s	Id unit meet all of the following criteria? In slope (<i>slope can be very gradual</i>), In rough the wetland in one direction (unidirectional) and usually comes from subsurface, as sheetflow, or in a swale without distinct banks, In e wetland without being impounded.
	NO – go to 5	YES – The wetland class is Slope
		does not pond in these type of wetlands except occasionally in very small and r behind hummocks (depressions are usually <3 ft diameter and less than 1 ft
5.		nd unit meet all of the following criteria? ey, or stream channel, where it gets inundated by overbank flooding from that

NO - go to 6

YES – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7

YES - The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES - The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

1 class to in rating
in rating
verine
ressional
e Fringe
ressional
ressional
verine
eat as
UARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water of	quality
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland:	
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no ou	
·	ints = 3
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing out	ints = 2
' - ' - ' - ' - ' - ' - ' - ' - ' - ' -	ints = 1
, , , , , , , , , , , , , , , , , , , ,	ints = 1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4	No = 0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin	n classes):
Wetland has persistent, ungrazed, plants > 95% of area poi	ints = 5
, , , , , , , , , , , , , , , , , , , ,	ints = 3
, 10	ints = 1
Wetland has persistent, ungrazed plants $<^1/_{10}$ of area poi	ints = 0
D 1.4. Characteristics of seasonal ponding or inundation:	
This is the area that is ponded for at least 2 months. See description in manual.	
	ints = 4
	ints = 2
1-4	ints = 0
Total for D 1 Add the points in the boxes	above
Rating of Site Potential If score is:12-16 = H	the first page
D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1	No = 0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1	No = 0 /
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1	No = 0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2	2.3?
SourceYes = 1	No = 0
Total for D 2 Add the points in the boxes	above /
Rating of Landscape Potential If score is:3 or 4 = H \(\bigcup_1 \) or 2 = M0 = L Record the ratio	ng on the first page
D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is o	on the
303(d) list? Yes = 1	No = 0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1	
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (ar if there is a TMDL for the basin in which the unit is found)? Yes = 2	
Total for D 3 Add the points in the boxes	s above 4
Rating of Value If score is: 2-4 = H1 = M0 = L Record the rating on the first	st page

DEPRESSIONAL AND FLATS WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce	flooding and stream degradation
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland:	
Wetland is a depression or flat depression with no surface water leaving it (no Wetland has an intermittently flowing stream or ditch, OR highly constricted procession (QUESTION 7 on key), whose outlet is a permanen Wetland has an unconstricted, or slightly constricted, surface outlet that is per	permanently flowing outletpoints = 2 atly flowing ditch points = 1
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the	
with no outlet, measure from the surface of permanent water or if dry, the dee Marks of ponding are 3 ft or more above the surface or bottom of outlet	pest part. points = 7
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3
The wetland is a "headwater" wetland	points = 3
Wetland is flat but has small depressions on the surface that trap water	points = 1
Marks of ponding less than 0.5 ft (6 in)	points = 0
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of contributing surface water to the wetland to the area of the wetland unit itself	
The area of the basin is less than 10 times the area of the unit	points = 5
The area of the basin is 10 to 100 times the area of the unit	points = 3
The area of the basin is more than 100 times the area of the unit	points = 0
Entire wetland is in the Flats class	points = 5
	d the points in the boxes above 5
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on the first page
D 5.0. Does the landscape have the potential to support hydrologic functions	of the site?
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0
D 5.2. Is $>10\%$ of the area within 150 ft of the wetland in land uses that generate except $= 1.0\%$ of the area within 150 ft of the wetland in land uses that generate except $= 1.0\%$ of the area within 150 ft of the wetland in land uses that generate except $= 1.0\%$ of the area within 150 ft of the wetland in land uses that generate except $= 1.0\%$ of the area within 150 ft of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland in land uses that generate except $= 1.0\%$ of the wetland $= 1.0\%$ of	
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intens >1 residence/ac, urban, commercial, agriculture, etc.)?	sive human land uses (residential at Yes = 1 No = 0
Total for D 5	d the points in the boxes above
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the first page
D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. Choose the description to the wetland unit being rated. Do not add points. Choose the highest score if more than the wetland captures surface water that would otherwise flow down-gradient damaged human or natural resources (e.g., houses or salmon redds):	nore than one condition is met. t into areas where flooding has
Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2
Surface flooding problems are in a sub-basin farther down-gradient. Standing from proveduate is an increase in the pull basin.	points = 1
Flooding from groundwater is an issue in the sub-basin.	points = 1
The existing or potential outflow from the wetland is so constrained by humar water stored by the wetland cannot reach areas that flood. <i>Explain why</i>	n or natural conditions that the points = 0
There are no problems with flooding downstream of the wetland.	points = 0
D 6.2. Has the site been identified as important for flood storage or flood conveyance	e in a regional flood control plan? Yes = 2 No = 0
Total for D 6 Ad	d the points in the boxes above Z
Rating of Value If score is:1 = M0 = L	Record the rating on the first page

Wetland Rating System for Western WA: 2014 Update Rating Form – Effective January 1, 2015

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS		
Water Quality Functions - Indicators that the site functions to	improve water quality	
R 1.0. Does the site have the potential to improve water quality?		
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments du	ring a flooding event:	
Depressions cover >3/4 area of wetland	points = 8	
Depressions cover > ½ area of wetland	points = 4	
Depressions present but cover < 1/2 area of wetland	points = 2	
No depressions present	points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cov	vardin classes)	
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8	
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^2/_3$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^{1}/_{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	
Total for R 1 Add the points in the boxes above		
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on th	ne first page
R 2.0. Does the landscape have the potential to support the water quality function	n of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests within the last 5 years?	that have been clearcut Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutar	nts? Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in Other sources	questions R 2.1-R 2.4 Yes = 1 No = 0	
Total for R 2 Add the	points in the boxes above	
Rating of Landscape Potential If score is:3-6 = H1 or 2 = M0 = L	Record the rating on th	ne first page
R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that	t drains to one within 1 mi?	
	Yes = 1 No = 0	
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or p		
N 3.2. 13 the Wetland Glorig & Stream of tive, that has Two Finnes for hatherts, toxics, or p	Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintainir		
YES if there is a TMDL for the drainage in which the unit is found)	Yes = 2 No = 0	
	points in the boxes above	
Pating of Value If score is: 2.4 - H 1 - M 0 - I	Record the rating on t	he first nage

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS		
Hydrologic Functions - Indicators that site functions to re	duce flooding and stream erosior)
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides:		
Estimate the average width of the wetland perpendicular to the direction of	of the flow and the width of the	
stream or river channel (distance between banks). Calculate the ratio: (av	verage width of wetland)/(average	
width of stream between banks).		
If the ratio is more than 20	points = 9	
If the ratio is 10-20	points = 6	
If the ratio is 5-<10	points = 4	
If the ratio is 1-<5	points = 2	
If the ratio is < 1	points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: Tr		
shrub. Choose the points appropriate for the best description (polygons ne	eed to have >90% cover at person	13
height. These are <u>NOT Cowardin</u> classes).		
Forest or shrub for $>^1/_3$ area OR emergent plants $>^2/_3$ area	points = 7	
Forest or shrub for $> 1/10$ area OR emergent plants $> 1/10$ area	points = 4	
Plants do not meet above criteria	points = 0	
Total for R 4	Add the points in the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on th	ie first page
R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	
Total for R 5	Add the points in the boxes above	
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on th	ie first page
R 6.0. Are the hydrologic functions provided by the site valuable to societ	ty?	
R 6.1. Distance to the nearest areas downstream that have flooding problems?		
Choose the description that best fits the site.		
The sub-basin immediately down-gradient of the wetland has flooding pro	oblems that result in damage to	
human or natural resources (e.g., houses or salmon redds)	points = 2	
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	
R 6.2. Has the site been identified as important for flood storage or flood convey	1	
	Yes = 2 No = 0	
Total for R 6	Add the points in the boxes above	

Rating of Value If score is:___2-4 = H ____1 = M ____0 = L

Record the rating on the first page

Wetland name or number A, B, C, D

LAKE FRINGE WETLANDS		
Water Quality Functions - Indicators that the site functions to impro	ove water quality	
L 1.0. Does the site have the potential to improve water quality?		
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes):		
Plants are more than 33 ft (10 m) wide	points = 6	
Plants are more than 16 ft (5 m) wide and <33 ft	points = 3	
Plants are more than 6 ft (2 m) wide and <16 ft	points = 1	
Plants are less than 6 ft wide	points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that result points, and do not include any open water in your estimate of coverage. The herbaceous the dominant form or as an understory in a shrub or forest community. These are not Cow of cover is total cover in the unit, but it can be in patches. Herbaceous does not include aque Cover of herbaceous plants is $>90\%$ of the vegetated area Cover of herbaceous plants is $>^2/_3$ of the vegetated area Cover of herbaceous plants is $>^1/_3$ of the vegetated area Other plants that are not aquatic bed $>^2/_3$ unit Other plants that are not aquatic bed in $>^1/_3$ vegetated area Aquatic bed plants and open water cover $>^2/_3$ of the unit	plants can be either vardin classes. Area	
Rating of Site Potential If score is:8-12 = H4-7 = M0-3 = L	Record the rating on t	ne first page
L 2.0. Does the landscape have the potential to support the water quality function of the	e site?	
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0	
L 2.2. Is > 10% of the area within 150 ft of wetland unit on the upland side in land uses that gene	rate pollutants?	
	Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil?	Yes = 1 No = 0	

Total for L 2	Add the points in the boxes above	
Rating of Landscape Potential: If score is:2 or 3 = H1 = M0 = L	Record the rating on th	ne first page

L 3.0. Is the water quality improvement provided by the site valuable t	o society?
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one ac 303(d) list)?	quatic resource in the basin is on the Yes = 1 No = 0
L 3.3. Has the site been identified in a watershed or local plan as important for if there is a TMDL for the lake or basin in which the unit is found.	or maintaining water quality? <i>Answer YES</i> Yes = 2 No = 0
Total for L 3	Add the points in the boxes above

Rating of Value If score is: ___2-4 = H ____1 = M ____0 = L

Record the rating on the first page

LAVE EDINGE WETLANDS		
LAKE FRINGE WETLANDS		
Hydrologic Functions - Indicators that the wetland unit functions to red	uce shoreline erosi	on
L 4.0. Does the site have the potential to reduce shoreline erosion?		
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do not inc Choose the highest scoring description that matches conditions in the wetland.	clude Aquatic bed):	
> % of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6	
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4	
> ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4	
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2	
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0	
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on t	he first page
L 5.0. Does the landscape have the potential to support the hydrologic functions of the s	ite?	
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5 Add the points	in the boxes above	
Rating of Landscape Potential If score is:2 = H1 = M0 = L	Record the rating on I	he first page
L 6.0. Are the hydrologic functions provided by the site valuable to society?		
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one resources the one with the highest score.	ource is present,	
There are human structures or old growth/mature forests within 25 ft of OHWM of the sho	ore in the unit	
	points = 2	
There are nature trails or other paths and recreational activities within 25 ft of OHWM	points = 1	
Other resources that could be impacted by erosion	points = 1	
There are no resources that can be impacted by erosion along the shores of the unit	points = 0	

NOTES and FIELD OBSERVATIONS:

Rating of Value: If score is: 2 = H 1 = M 0 = L

Record the rating on the first page

Wetland name or number A, B, C, D

SLOPE WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every	
100 ft of horizontal distance)	
Slope is 1% or less	
Slope is > 1%-2% points = 2	
Slope is > 2%-5% points = 1	
Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions): Yes = 3 No = 0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants:	
Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you	
have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher	
than 6 in.	
Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > % of area points = 3	1
berise, unext, her bacebas plants - 12 of silver	
bense, woody, plants > 72 or area	
Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	
bots not meet any of the effect above for plants	
Total for S 1 Add the points in the boxes above	
Rating of Site Potential If score is: 12 = H 6-11 = M 0-5 = L Record the rating on the state of	he first page
S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?	
Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	
Other sources Yes = 1 No = 0	
Total for S 2 Add the points in the boxes above	
Rating of Landscape Potential If score is:1-2 = M0 = L Record the rating on the first page	
C 2 O 1. the content wealth impressed to provided by the cite valuable to society?	
S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the $303(d)$ list? Yes = 1 No = 0	
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the $303(d)$ list. Yes = 1 No = 0	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES if there is a TMDL for the basin in which unit is found. Yes = 2 No = 0	
Total for S 3 Add the points in the boxes above	

Wetland name or number _____

SLOPE WEILANDS		
Hydrologic Functions - Indicators that the site functions to reduce floor	ding and stream eros	sion
S 4.0. Does the site have the potential to reduce flooding and stream erosion?		
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose t for the description that best fits conditions in the wetland. Stems of plants should be thic in), or dense enough, to remain erect during surface flows. Dense, uncut, rigid plants cover > 90% of the area of the wetland		
All other conditions	points = 0	
Rating of Site Potential If score is:1 = M0 = L	Record the rating on	the first page
S 5.0. Does the landscape have the potential to support the hydrologic functions of the	e site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that $\mathfrak g$ surface runoff?	generate excess Yes = 1 No = 0	
Rating of Landscape Potential If score is:1 = M0 = L	Record the rating on	the first page
S 6.0. Are the hydrologic functions provided by the site valuable to society?		
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in dai natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	mage to human or points = 2 points = 1 points = 0	
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a region	nal flood control plan? Yes = 2 No = 0	
Total for S 6 Add the point	ts in the boxes above	
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on	the first page

NOTES and FIELD OBSERVATIONS:

These questions apply to wetlands of all HGM classes.		
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of % ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. Aquatic bed Emergent Scrub-shrub (areas where shrubs have > 30% cover) Forested (areas where trees have > 30% cover) If the unit has a Forested class, check if: The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	Ø	
H 1.2. Hydroperiods		
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). Permanently flooded or inundated Seasonally flooded or inundated Occasionally flooded or inundated Saturated only Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland Lake Fringe wetland Freshwater tidal wetland 2 points	6	
H 1.3. Richness of plant species		
Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle If you counted: > 19 species points = 2 5 - 19 species points = 1 < 5 species points = 0	6	
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points Low = 1 point Moderate = 2 points All three diagrams in this row are HIGH = 3points	φ	

H 1.5. Special habitat features:		
Check the habitat features that are present in the wetland. The number of checks is the number	er of points.	
Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).		
Standing snags (dbh > 4 in) within the wetland		
Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at	least 3.3 ft (1 m)	
over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)		
Stable steep banks of fine material that might be used by beaver or muskrat for denning (
slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet	weathered	E
where wood is exposed)		
At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas th	at are	4
permanently or seasonally inundated (structures for egg-laying by amphibians)	1 1 for 1 lot of	1
Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1	1 for list of	
strata) Total for H 1 / Add the points in tl	ne boxes above	1
	cord the rating on	the first name
		ine jirst page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?		
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).		
Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2]	=%	
If total accessible habitat is:		
$> \frac{1}{3}$ (33.3%) of 1 km Polygon	points = 3	1
20-33% of 1 km Polygon	points = 2	1
10-19% of 1 km Polygon	points = 1	
< 10% of 1 km Polygon	points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.		
Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2]_	= %	
Undisturbed habitat > 50% of Polygon	points = 3	1
Undisturbed habitat 10-50% and in 1-3 patches	points = 2	l
Undisturbed habitat 10-50% and > 3 patches	points = 1	
Undisturbed habitat < 10% of 1 km Polygon	points = 0	
H 2.3. Land use intensity in 1 km Polygon: If		
> 50% of 1 km Polygon is high intensity land use	points = (- 2)	-7
≤ 50% of 1 km Polygon is high intensity	points = 0	
Total for H 2 Add the points in t		D
Rating of Landscape Potential If score is:4-6 = H1-3 = M \<1 = L Rec	ord the rating on t	he first page
H 3.0. Is the habitat provided by the site valuable to society?		
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the translation to the supplied to the provided the size protect</i>	ne highest score	
that applies to the wetland being rated.		
Site meets ANY of the following criteria:	points = 2	
Lt has 3 or more priority habitats within 100 m (see next page)	6 1 . 11	
— It provides habitat for Threatened or Endangered species (any plant or animal on the state	e or federal lists)	フ
— It is mapped as a location for an individual WDFW priority species		
— It is a Wetland of High Conservation Value as determined by the Department of Natural Re		
— It has been categorized as an important habitat site in a local or regional comprehensive p	ian, in a	
Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m	points = 1	
Site does not meet any of the criteria above	points = 0	
ating of Value If score is: Y2 = H1 = M0 = L Record the rating on the first		the first page

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE:** This question is independent of the land use between the wetland unit and the priority habitat.

- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests: Old-growth west of Cascade crest Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
 component is important (full descriptions in WDFW PHS report p. 158 see web link above).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 see web link above*).
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report see web link on previous page).
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands	
Does the wetland meet the following criteria for Estuarine wetlands?	
— The dominant water regime is tidal,	
Vegetated, and	
— With a salinity greater than 0.5 ppt Yes –Go to SC 1.1 No= Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?	
 The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- 	Cat. I
mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV)	
SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High	
Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3	Cat. I
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?	
Yes = Category I No = Not a WHCV	
SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?	
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhowetlands.pdf	
Yes - Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV	
SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on	
their website? Yes = Category I No = Not a WHCV	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key	
below. If you answer YES you will still need to rate the wetland based on its functions.	
SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or	
more of the first 32 in of the soil profile? Yes – Go to SC 3.3 No – Go to SC 3.2	
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep	
over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to SC 3.3 No = Is not a bog	
For the second section of the section of	
cover of plant species listed in Table 4? Yes = is a Category i bog No - Go to SC 3.4	1
NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by	
measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the	
plant species in Table 4 are present, the wetland is a bog.	Cat. I
SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar,	
western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the	1
species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?	
Yes = Is a Category I bog No = Is not a bog	

Wetland name or number A,B,C,D

SC 4.0. Forested Wetlands	
Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA	
Department of Fish and Wildlife's forests as priority habitats? If you answer YES you will still need to rate	
the wetland based on its functions. — Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered	
canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of	
age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.	
Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the	
species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from	
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	
— The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)	
during most of the year in at least a portion of the lagoon (needs to be measured near the bottom) Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon	Cat. I
SC 5.1. Does the wetland meet all of the following three conditions?	,
— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less	
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	Cat. II
— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
mowed grassland.	
— The wetland is larger than $^{1}/_{10}$ ac (4350 ft ²)	
Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands	
Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If	
you answer yes you will still need to rate the wetland based on its habitat functions.	
In practical terms that means the following geographic areas:	
— Long Beach Peninsula: Lands west of SR 103	Çat I
 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 	
Yes – Go to SC 6.1 No = not an interdunal wetland for rating	
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M	Cat. II
for the three aspects of function)? Yes = Category I No – Go to SC 6.2	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	Cat. III
Yes = Category II No - Go to SC 6.3	
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	
ics = databoly No databoly to	Cat. IV
Category of wetland based on Special Characteristics	
If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland	name	or	number	

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RATING	SUMMARY	/ - Western	Washington
	1 16 0		

Name of wetland (or ID #): Uk Hand E Date	of site visit: 10/8/18
Rated by <u>J. Marriott</u> Trained by Ecology? <u>Y</u> es	
HGM Class used for rating Depress Wetland has multiple H	GM classes? <u></u> VN
NOTE: Form is not complete without the figures requested (figure	es can be combined).
Source of base aerial photo/map	
OVERALL WETLAND CATEGORY (based on functions or	special characteristics)
1. Category of wetland based on FUNCTIONS	
Category I — Total score = 23 - 27	
Category II – Total score = 20 - 22 76	Score for each function based
Category III – Total score = 16 - 19	on three

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		Circle the ap	propriate ratings	
Site Potential	H M L	H M (L)	H (M) L	
Landscape Potential	H M F	H M L	H M ()	
Value	A M L	H) M L	H M L	TOTAL
Score Based on Ratings	7	6	6	19

Category IV - Total score = 9 - 15

Score for each function based on three ratings (order of ratings is not important) 9 = H,H,H

7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L 5 = M,M,L 4 = M,L,L

3 = L,L,L

8 = H,H,M

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CAT	EGORY
Estuarine	I	II
Wetland of High Conservation Value		I
Bog		I
Mature Forest		I
Old Growth Forest		I
Coastal Lagoon	I	II
Interdunal	I II	III IV
None of the above		

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L1.1, L4.1, H1.1, H1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	5 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	\$ 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

C	questions 1-7 apply, and go to Q	uestion 8.
1.	Are the water levels in the ent	re unit usually controlled by tides except during floods?
	NO - go to 2	YES – the wetland class is Tidal Fringe – go to 1.1
1	1.1 Is the salinity of the water du	ring periods of annual low flow below 0.5 ppt (parts per thousand)?
		ed as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If i an Estuarine wetland and is not scored. This method cannot be used to
2.		and precipitation is the only source (>90%) of water to it. Groundwate OT sources of water to the unit.
	NO – go to 3 If your wetland can be classifie	YES – The wetland class is Flats d as a Flats wetland, use the form for Depressional wetlands.
3.	The vegetated part of the w plants on the surface at any	neet all of the following criteria? etland is on the shores of a body of permanent open water (without any time of the year) at least 20 ac (8 ha) in size; ter area is deeper than 6.6 ft (2 m).
	NO – go to 4	YES - The wetland class is Lake Fringe (Lacustrine Fringe)
4.	The wetland is on a slope (The water flows through the seeps. It may flow subsurfa	neet all of the following criteria? Islope can be very gradual), Islope wetland in one direction (unidirectional) and usually comes from ce, as sheetflow, or in a swale without distinct banks, Ind without being impounded.
	NO - go to 5	YES – The wetland class is Slope
		pond in these type of wetlands except occasionally in very small and hummocks (depressions are usually <3 ft diameter and less than 1 ft
5.	The unit is in a valley, or st stream or river,	neet all of the following criteria? ream channel, where it gets inundated by overbank flooding from that ars at least once every 2 years.

Wetland i	name or	number	
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NO - go to 6

YES - The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7

YES - The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS Water Quality Functions - Indicators that the site functions to improve water quality	
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland:	
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area Wetland has persistent, ungrazed, plants > ½ of area Wetland has persistent, ungrazed plants > $^{1}/_{10}$ of area Wetland has persistent, ungrazed plants < $^{1}/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^{1}/_{10}$ of area points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: This is the area that is ponded for at least 2 months. See description in manual. Area seasonally ponded is > ½ total area of wetland Area seasonally ponded is > ½ total area of wetland Area seasonally ponded is < ½ total area of wetland points = 2 Area seasonally ponded is < ½ total area of wetland points = 0	2
Total for D 1 Add the points in the boxes above	8
Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L Record the rating on the first p	age
D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	Ø
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	\$
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source Yes = 1 No = 0	Ø
Total for D 2 Add the points in the boxes above	
Rating of Landscape Potential If score is:3 or 4 = H1 or 2 = M0 = L Record the rating on the f	rst page
D 3.0. Is the water quality improvement provided by the site valuable to society?	*
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	(
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = $1 \text{ No} = 0$	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES if there is a TMDL for the basin in which the unit is found)? Yes = 2 No = 0	2,
Total for D 3 Add the points in the boxes above	4
Rating of Value If score is: 2-4 = H1 = M0 = L Record the rating on the first page	t

DEPRESSIONAL AND FLATS WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degrada	tion
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outletpoints = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	\$
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	8
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class Text for P.4.	5
Total for D 4 Add the points in the boxes above Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L Record the rating on the	o first page
	e jiist puye
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	Ø
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	Ø
Total for D 5 Add the points in the boxes above	
Rating of Landscape Potential If score is:3 = H \1 or 2 = M0 = L Record the rating on the	e first page
D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the	2
water stored by the wetland cannot reach areas that flood. Explain why points = 0 There are no problems with flooding downstream of the wetland. points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	2
Rating of Value If score is: 1/2-4 = H1 = M0 = L Record the rating on the	e first page

RIVERINE AND FRESHWATER TIDAL FRINGE W	ETLANDS	
Water Quality Functions - Indicators that the site functions to in	prove water quality	
R 1.0. Does the site have the potential to improve water quality?		
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments durin	g a flooding event:	
Depressions cover > 3/4 area of wetland	points = 8	
Depressions cover > ½ area of wetland	points = 4	
Depressions present but cover < ½ area of wetland	points = 2	
No depressions present	points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowar		
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8	
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^{2}/_{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^{1}/_{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	
Total for R 1 Add the points in the boxes above		
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on t	he first page
R 2.0. Does the landscape have the potential to support the water quality function of	of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests th within the last 5 years?	at have been clearcut Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants	? Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in qu	estions R 2.1-R 2.4	
Other sources	Yes = 1 No = 0	
Total for R 2 Add the po	oints in the boxes above	
Rating of Landscape Potential If score is:3-6 = H1 or 2 = M0 = L	Record the rating on t	he first page
R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that d	rains to one within 1 mi?	
	Yes = 1 No = 0	
D 2 2 1 she while d d a second distribution for the second		
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pat	Yes = 1 No = 0	
D 2.2 Has the site been identified in a watershed as least plan as important for maintaining		
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining YES if there is a TMDL for the drainage in which the unit is found)	water quality: $(answer$ Yes = 2 No = 0	
	oints in the boxes above	
Rating of Value If score is: 2-4 = H 1 = M 0 = L	Record the rating on t	he first nage
nating of value it score is2-4 - ITI - IVIV - E	necola the rating on t	j.i.s. page

RIVERINE AND FRESHWATER TIDAL FRI	NGE WETLANDS
Hydrologic Functions - Indicators that site functions to red	
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction of stream or river channel (distance between banks). Calculate the ratio: (ave width of stream between banks).	rage width of wetland)/(average
If the ratio is more than 20	points = 9
If the ratio is 10-20	points = 6
If the ratio is 5-<10	points = 4
If the ratio is 1-<5	points = 2
If the ratio is < 1	points = 1
R 4.2. Characteristics of plants that slow down water velocities during floods: Tree shrub. Choose the points appropriate for the best description (polygons need height. These are NOT Cowardin classes). Forest or shrub for >1/3 area OR emergent plants > 2/3 area	
Forest or shrub for $> 7_3$ area ON emergent plants $> 7_3$ area Forest or shrub for $> 1/1_0$ area OR emergent plants $> 1/3$ area	points = 4
Plants do not meet above criteria	points = 0
	Add the points in the boxes above
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on the first pa
R 5.0. Does the landscape have the potential to support the hydrologic fur	actions of the site?
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1
Total for R 5	Add the points in the boxes above
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the first pa
R 6.0. Are the hydrologic functions provided by the site valuable to society	?
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The sub-basin immediately down-gradient of the wetland has flooding probleman or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	plems that result in damage to points = 2 points = 1 points = 0
R 6.2. Has the site been identified as important for flood storage or flood conveya	nce in a regional flood control plan? Yes = 2 No = 0
Total for R 6	Add the points in the boxes above
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on the first pa

LAKE FRINGE WETLANDS Water Quality Functions - Indicators that the site functions to important the site functions are important.	rove water quality	
L 1.0. Does the site have the potential to improve water quality?		
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes): Plants are more than 33 ft (10 m) wide Plants are more than 16 ft (5 m) wide and <33 ft Plants are more than 6 ft (2 m) wide and <16 ft Plants are less than 6 ft wide L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that resu points, and do not include any open water in your estimate of coverage. The herbaceous		
the dominant form or as an understory in a shrub or forest community. These are not Co of cover is total cover in the unit, but it can be in patches. Herbaceous does not include aq Cover of herbaceous plants is $>90\%$ of the vegetated area Cover of herbaceous plants is $>^2/_3$ of the vegetated area Cover of herbaceous plants is $>^1/_3$ of the vegetated area Other plants that are not aquatic bed $>^2/_3$ unit Other plants that are not aquatic bed in $>^1/_3$ vegetated area Aquatic bed plants and open water cover $>^2/_3$ of the unit	wardin classes. Area uatic bed. points = 6 points = 3 points = 3 points = 1 points = 0	
	s in the boxes above Record the rating on th	o first nago
Rating of Site Potential If score is:8-12 = H4-7 = M0-3 = L L 2.0. Does the landscape have the potential to support the water quality function of the		e jiist page
L 2.1. Is the lake used by power boats?	Yes = 1 No = 0	
L 2.2. Is > 10% of the area within 150 ft of wetland unit on the upland side in land uses that gene	erate pollutants? Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil?	Yes = 1 No = 0	
Total for L 2 Add the point	s in the boxes above	
Rating of Landscape Potential: If score is:2 or 3 = H1 = M0 = L	Record the rating on th	ne first page
L 3.0. Is the water quality improvement provided by the site valuable to society?		
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0	
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in 303(d) list)?	Yes = 1 No = 0	
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining wat if there is a TMDL for the lake or basin in which the unit is found.	Yes = 2 No = 0	
Total for L 3 Add the point	s in the boxes above	l

Record the rating on the first page

Rating of Value If score is:___2-4 = H ___1 = M ___0 = L

LAKE FRINGE WETLANDS	
Hydrologic Functions - Indicators that the wetland unit functions to re-	duce shoreline erosion
L 4.0. Does the site have the potential to reduce shoreline erosion?	
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do not in Choose the highest scoring description that matches conditions in the wetland.	nclude Aquatic bed);
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4
> 1/4 distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on the first page
L 5.0. Does the landscape have the potential to support the hydrologic functions of the	site?
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0
Total for L 5 Add the point	s in the boxes above
Rating of Landscape Potential If score is:2 = H1 = M0 = L	Record the rating on the first page
L 6.0. Are the hydrologic functions provided by the site valuable to society?	
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one rechoose the one with the highest score.	
There are human structures or old growth/mature forests within 25 ft of OHWM of the s	hore in the unit
	points = 2
There are nature trails or other paths and recreational activities within 25 ft of OHWM	points = 1
Other resources that could be impacted by erosion	points = 1
There are no resources that can be impacted by erosion along the shores of the unit	points = 0
Rating of Value: If score is: 2 = H 1 = M 0 = L	Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

Rating of Value: If score is: __2 = H ___1 = M ___0 = L

	1	
•	-	-
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SLOPE WETLANDS		1
Water Quality Functions - Indicators that the site functions to improve water quality		
S 1.0. Does the site have the potential to improve water quality?		
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every		7
100 ft of horizontal distance)	12	
Slope is 1% or less points = 3	2	
Slope is > 1%-2% points = 2	$\mathcal{O}_{\mathcal{O}}$	
Slope is > 2%-5% points = 1		
Slope is greater than 5% points = 0		4
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions): Yes = 3 No = 0		4
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants:		
Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you		
have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher		1
than 6 in.	1	
Dense, uncut, herbaceous plants > 90% of the wetland area points = 6		3
Dense, uncut, herbaceous plants > ½ of area points = 3	6	
Dense, woody, plants > ½ of area points = 2		
Dense, uncut, herbaceous plants > ¼ of area points = 1		
Does not meet any of the criteria above for plants points = 0		_
Total for S 1 Add the points in the boxes above	9_	╛
Rating of Site Potential If score is: 12 = H 16-11 = M 0-5 = L Record the rating on the	ıe first page	?
S 2.0. Does the landscape have the potential to support the water quality function of the site?		
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?	1	
Yes = 1 No = 0		
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	1	
Other sources Yes = 1 No = 0		
Total for S 2 Add the points in the boxes above	2	
Rating of Landscape Potential If score is:0 = L Record the rating on the	he first page	e
S 3.0. Is the water quality improvement provided by the site valuable to society?		7
		4
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0		
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the $303(d)$ list. Yes = 1 No = 0	1	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES if there is a TMDL for the basin in which unit is found. Yes = 2 No = 0	2	
Total for \$ 3 Add the points in the boxes above	4	
Rating of Value If score is: 2-4 = H1 = M0 = L Record the rating on to	he first pag	e

SLOPE WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream eros	ion
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > \frac{1}{8} in), or dense enough, to remain erect during surface flows. Dense, uncut, rigid plants cover > 90% of the area of the wetland All other conditions Dense, uncut, rigid plants cover > 90% of the area of the wetland points = 0	J
Rating of Site Potential If score is:1 = M0 = L	the first page
S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = $1 \text{ No} = 0$	/
Rating of Landscape Potential If score is:0 = L Record the rating on the score is:0 = L	the first page
S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream points = 0	2
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	Ø
Total for S 6 Add the points in the boxes above	2
Rating of Value If score is 2-4 = H 1 = M 0 = L Record the rating on the score is 1 = M 1	the first page

NOTES and FIELD OBSERVATIONS:



These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat H 1.0. Does the site have the potential to provide habitat? H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. 4 structures or more: points = 4 Aquatic bed Emergent 3 structures: points = 2 2 structures: points = 1 Scrub-shrub (areas where shrubs have > 30% cover) 1 structure: points = 0 Forested (areas where trees have > 30% cover) If the unit has a Forested class, check if: The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). 4 or more types present: points = 3 Permanently flooded or inundated 3 types present: points = 2 Seasonally flooded or inundated Occasionally flooded or inundated 2 types present: points = 1 1 type present: points = 0 Saturated only Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland 2 points 1/ Lake Fringe wetland 2 points Freshwater tidal wetland H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle points = 2If you counted: > 19 species points = 15 - 19 species points = 0< 5 species H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. Moderate = 2 points None = 0 points Low = 1 point All three diagrams in this row are HIGH = 3points

Wetland name or number	8
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). Standing snags (dbh > 4 in) within the wetland Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata) Total for H 1 Add the points in the boxes above	3
Rating of Site Potential If score is:15-18 = H7-14 = M0-6 = L	he first nage
	- Just page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit). Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] =% If total accessible habitat is: $> \frac{1}{3}$ (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	E
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] = % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	ϕ
Rating of Landscape Potential If score is:4-6 = H1-3 = M<1 = L Record the rating on the	ne first page
H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only the highest score that applies to the wetland being rated. Site meets ANY of the following criteria: points = 2 It has 3 or more priority habitats within 100 m (see next page) It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) It is mapped as a location for an individual WDFW priority species It is a Wetland of High Conservation Value as determined by the Department of Natural Resources It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m	2
Site does not meet any of the criteria above points = 0 Rating of Value If score is: 2 = H 1 = M 0 = L Record the rating on	the first page

Wetland name or number <u>E</u>

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE:** This question is independent of the land use between the wetland unit and the priority habitat.

- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests: Old-growth west of Cascade crest Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
 component is important (full descriptions in WDFW PHS report p. 158 see web link above).
- **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 see web link above*).
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report see web link on previous page).*
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands	
Does the wetland meet the following criteria for Estuarine wetlands?	
— The dominant water regime is tidal,	
— Vegetated, and	
— With a salinity greater than 0.5 ppt Yes –Go to SC 1.1 No= Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?	
 The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25) At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- 	Cat. I
mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category No = Category	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes – Gategory I. No – Net a WHCV.	Cat. I
Yes = Category I No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?	
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhowetlands.pdf	
Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on	
their website? Yes = Category I No = Not a WHCV	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below. If you answer YES you will still need to rate the wetland based on its functions.	
SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to SC 3.3 No – Go to SC 3.2	
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes — Go to SC 3.3 No = Is not a bog	
SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = is a Category i bog No - Go to SC 3.4	
NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the	
plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the	Cat. I
species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = Is a Category I bog No = Is not a bog	

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA	
Department of Fish and Wildlife's forests as priority habitats? If you answer YES you will still need to rate	
the wetland based on its functions.	
 Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). 	
Yes = Category I No = Not a forested wetland for this section	Cat. I
C 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	
The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (needs to be measured near the bottom) Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon	Cat. I
C 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	Cat. II
 At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. The wetland is larger than ¹/₁₀ ac (4350 ft²) 	
Yes = Category I No = Category II	
C 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If you answer yes you will still need to rate the wetland based on its habitat functions.	
In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103	
— Grayland-Westport: Lands west of SR 105	Cat I
Ocean Shores-Copalis: Lands west of SR 115 and SR 109	
Yes – Go to SC 6.1 No = not an interdunal wetland for rating	
C 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = Category I No – Go to SC 6.2	Cat. I
C 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = Category II No – Go to SC 6.3	Cat. I
Yes = Category II No – Go to SC 6.3	
C 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category II No - Go to SC 6.3 Yes = Category II No - Go to SC 6.3 Yes = Category II No - Go to SC 6.3	Cat. I

Wetland name or number _____

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RATING SUMMARY – Western Washington

Name of wetland (or ID #):	Date of site visit: $\frac{10/8}{8}$
Rated by J. Marriott	Trained by Ecology? $\sqrt{\text{Yes}}$ No Date of training $\frac{4}{2}$ 2015
HGM Class used for rating Riparian	Wetland has multiple HGM classes?YN
NOTE: Form is not complete without Source of base aerial photo/map	t the figures requested (figures can be combined).
OVERALL WETLAND CATEGORY	(based on functionsor special characteristics)
1. Category of wetland based on FUI	

Category I — Total score = 23 - 27	100
Category II - Total score = 20 - 22	100
Category III – Total score = 16 - 19	
Category IV — Total score = 9 - 15	

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		Circle the ap	propriate ratings	
Site Potential	H (M) L	H M L	H M L	
Landscape Potential	H M L	H M L	H M D	
Value	H) M L	H M L	H M L	TOTAL
Score Based on Ratings	8	7	6	21

Score for each function based on three ratings (order of ratings is not important)

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L

6 = M,M,M 5 = H,L,L 5 = M,M,L 4 = M,L,L 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CAT	CATEGORY	
Estuarine	I	II	
Wetland of High Conservation Value		I	
Bog		I	
Mature Forest		I	
Old Growth Forest		I	
Coastal Lagoon	I	11	
Interdunal	I II	III IV	
None of the above			

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

To answer questions:	Figure #
L 1.1, L 4.1, H 1.1, H 1.4	
L 1.2	
L 2.2	
H 2.1, H 2.2, H 2.3	
L 3.1, L 3.2	
L 3.3	
	L 1.1, L 4.1, H 1.1, H 1.4 L 1.2 L 2.2 H 2.1, H 2.2, H 2.3

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

_			
1.	. Are the water levels in the	entire unit usually contro	olled by tides except during floods?
	NO – go to 2	YES – the v	vetland class is Tidal Fringe – go to 1.1
	1.1 Is the salinity of the wate	r during periods of annua	al low flow below 0.5 ppt (parts per thousand)?
		ssified as a Freshwater Ti t is an Estuarine wetland	YES – Freshwater Tidal Fringe dal Fringe use the forms for Riverine wetlands. If it d and is not scored. This method cannot be used to
2.	. The entire wetland unit is fand surface water runoff and		ne only source (>90%) of water to it. Groundwater to the unit.
	NO – go to 3 If your wetland can be class	ified as a Flats wetland, u	YES – The wetland class is Flats se the form for Depressional wetlands.
3.	. Does the entire wetland unThe vegetated part of the plants on the surface at aAt least 30% of the open	e wetland is on the shore any time of the year) at le	s of a body of permanent open water (without any east 20 ac (8 ha) in size;
	NO – go to 4	YES – The wetland c	lass is Lake Fringe (Lacustrine Fringe)
4.	The water flows throug seeps. It may flow subs	oe (<i>slope can be very grad</i> h the wetland in one dire	dual), ection (unidirectional) and usually comes from a swale without distinct banks,
	NO – go to 5		YES – The wetland class is Slope
			wetlands except occasionally in very small and ions are usually <3 ft diameter and less than 1 ft
5.	. Does the entire wetland un	it meet all of the followi	ng criteria?

___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that

___The overbank flooding occurs at least once every 2 years.

stream or river,

Wetland name or number	
------------------------	--

NO - go to 6

YES - The wetland class is Riverine

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7

YES – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS		
Water Quality Functions - Indicators that the site functions to improve water quality		
D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (n		
Made at the control of the state of the stat	points = 3	
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing	points = 2	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes		
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowa		
Wetland has persistent, ungrazed, plants > 95% of area	points = 5	
Wetland has persistent, ungrazed, plants > ½ of area	points = 3	
Wetland has persistent, ungrazed plants $> \frac{1}{10}$ of area	points = 1	
Wetland has persistent, ungrazed plants $< \frac{1}{10}$ of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
This is the area that is ponded for at least 2 months. See description in manual.		
Area seasonally ponded is $> \frac{1}{2}$ total area of wetland	points = 4	
Area seasonally ponded is $> \frac{1}{4}$ total area of wetland	points = 2	
Area seasonally ponded is < ¼ total area of wetland	points = 0	
Total for D 1 Add the points in the bo	oxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L Record the rating	g on the first page	
D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	= 1 No = 0	
D 2.2. ls > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	= 1 No = 0	
D 2.3. Are there septic systems within 250 ft of the wetland?	= 1 No = 0	
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1	1-D 2.3?	
SourceYes	= 1 No = 0	
Total for D 2 Add the points in the bo	oxes above	
Rating of Landscape Potential If score is:3 or 4 = H1 or 2 = M0 = L Record the	rating on the first page	
D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that 303(d) list?	t is on the = 1 No = 0	
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	= 1 No = 0	
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality if there is a TMDL for the basin in which the unit is found)?	y (answer YES = 2 No = 0	
Total for D 3 Add the points in the b	oxes above	

Rating of Value If score is:___2-4 = H ___1 = M ___0 = L

DEPRESSIONAL AND FLATS WETLANDS		
Hydrologic Functions - Indicators that the site functions to reduce flooding a	nd stream degradatio	on
D 4.0. Does the site have the potential to reduce flooding and erosion?		
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently f Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing dit Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flow	tch points = 1	
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet The wetland is a "headwater" wetland Wetland is flat but has small depressions on the surface that trap water Marks of ponding less than 0.5 ft (6 in)	points = 7 points = 5 points = 3 points = 3 points = 1 points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of up contributing surface water to the wetland to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit The area of the basin is 10 to 100 times the area of the unit The area of the basin is more than 100 times the area of the unit Entire wetland is in the Flats class	points = 5 points = 3 points = 0 points = 5	
Total for D 4 Add the points in	the boxes above	
Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L	Record the rating on the fi	rst page
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human lan >1 residence/ac, urban, commercial, agriculture, etc.)?	nd uses (residential at Yes = 1 No = 0	
Total for D 5 Add the points in	n the boxes above	
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the fi	rst page
D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best match the wetland unit being rated. Do not add points. Choose the highest score if more than one of the wetland captures surface water that would otherwise flow down-gradient into areas who damaged human or natural resources (e.g., houses or salmon redds):	condition is met. here flooding has	
Flooding occurs in a sub-basin that is immediately down-gradient of unit. Surface flooding problems are in a sub-basin farther down-gradient. Flooding from groundwater is an issue in the sub-basin.	points = 2 points = 1 points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural co water stored by the wetland cannot reach areas that flood. Explain why	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional	flood control plan? Yes = 2 No = 0	
Total for D 6 Add the points in	the boxes above	
Rating of Value If score is:2-4 = H1 = M0 = L	Record the rating on the fi	rst page

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS				
Water Quality Functions - Indicators that the site functions to improve water quality				
R 1.0. Does the site have the potential to improve water quality?				
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flood	ng event:			
Depressions cover >3/4 area of wetland	points = 8			
Depressions cover > ½ area of wetland	points = 4			
Depressions present but cover < ½ area of wetland	points = 2			
No depressions present	points = 0			
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classe	es)			
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8			
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	/		
Herbaceous plants (> 6 in high) > $^2/_3$ area of the wetland	points = 6			
Herbaceous plants (> 6 in high) > $^{1}/_{3}$ area of the wetland	points = 3			
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	-		
Total for R 1 Add the points in the boxes above		8		
Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L Record the rating on the f				

R 2.0. Does the landscape have the potential to support the water quality function of th	e site?	
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	2
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that he within the last 5 years?	ave been clearcut Yes = 1 No = 0	Ø
R 2.4. Is $> 10\%$ of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in question of the sources	ons R 2.1-R 2.4 Yes = 1 No = 0	1
Total for R 2 Add the points	in the boxes above	5

R 3.0. Is the water quality improvement provided by the site valuable to society?

R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?

Yes = 1 No = 0

R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?

Yes = 1 No = 0

R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (answer YES if there is a TMDL for the drainage in which the unit is found)

Total for R 3

Add the points in the boxes above

Rating of Value If score is: 2-4=H 1=M 0=L

Rating of Landscape Potential If score is: 3-6 = H 1 or 2 = M 0 = L

Record the rating on the first page

DIVERSING AND EDGG WATER TIPM EDINGS WET AND	
RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS	وغلاثان
Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion	n
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides:	
Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the	
stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average	
width of stream between banks).	
If the ratio is more than 20 points = 9	
If the ratio is 10-20 points = 6	
If the ratio is 5-<10 points = 4	
If the ratio is 1-<5 points = 2	
If the ratio is < 1 points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large woody debris as forest or	
shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person	
height. These are <u>NOT Cowardin</u> classes).	
Forest or shrub for $> \frac{1}{3}$ area OR emergent plants $> \frac{2}{3}$ area points = 7	+
Forest or shrub for $> \frac{1}{10}$ area OR emergent plants $> \frac{1}{3}$ area points = 4	1
Plants do not meet above criteria points = 0	- a
Total for R 4 Add the points in the boxes above	
Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L Record the rating on the	ne first page
D.C.O. Desemble Lenders we have the metential to support the hydrologic functions of the cite?	
R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = 0 No = 1	Ø
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams? Yes = 0 No = 1	1
Total for R 5 Add the points in the boxes above	2
Rating of Landscape Potential If score is:3 = H1 or 2 = M0 = L Record the rating on the	ne first page
R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems?	
Choose the description that best fits the site.	
The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to	·
human or natural resources (e.g., houses or salmon redds) points = 2	
Surface flooding problems are in a sub-basin farther down-gradient points = 1	
No flooding problems anywhere downstream points = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	ch
Yes = 2 No = 0	φ
Total for R 6 Add the points in the boxes above	7

Rating of Value If score is: _____2-4 = H _____1 = M _____0 = L

LAKE FRINGE WETLANDS		
Water Quality Functions - Indicators that the site function	ons to improve water quality	
L 1.0. Does the site have the potential to improve water quality?		
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes	es):	
Plants are more than 33 ft (10 m) wide	points = 6	
Plants are more than 16 ft (5 m) wide and <33 ft	points = 3	
Plants are more than 6 ft (2 m) wide and <16 ft	points = 1	
Plants are less than 6 ft wide	points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate descript	ion that results in the highest	
points, and do not include any open water in your estimate of coverage. The		
the dominant form or as an understory in a shrub or forest community. The	se are not Cowardin classes. Area	
of cover is total cover in the unit, but it can be in patches. Herbaceous does n	ot include aquatic bed.	
Cover of herbaceous plants is >90% of the vegetated area	points = 6	
Cover of herbaceous plants is $>^2/_3$ of the vegetated area	points = 4	
Cover of herbaceous plants is $>^1/_3$ of the vegetated area	points = 3	
Other plants that are not aquatic bed > $^2/_3$ unit	points = 3	
Other plants that are not aquatic bed in $> \frac{1}{3}$ vegetated area	points = 1	
Aquatic bed plants and open water cover $> \frac{2}{3}$ of the unit	points = 0	
Total for L 1	Add the points in the boxes above	
Rating of Site Potential If score is: 8-12 = H 4-7 = M 0-3 = I	Record the rating on th	e first nage

L 2.0. Does the landscape have the potential to support the water quality function of the	site?	
L 2.1. Is the lake used by power boats?	Yes = 1	No = 0
L 2.2. Is > 10% of the area within 150 ft of wetland unit on the upland side in land uses that general	ate pollutar	nts?
	Yes = 1	No = 0
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil?	Yes = 1	No = 0
Total for L 2 Add the points in	n the boxes	s above

Rating of Landscape Potential: If score is: ___2 or 3 = H ___1 = M ___0 = L

Record the rating on the first page

L 3.0. Is the water quality improvement provided by the site valuable	to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources?	Yes = 1 No = 0	
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one 303(d) list)?	aquatic resource in the basin is on the Yes = 1 No = 0	
L 3.3. Has the site been identified in a watershed or local plan as important if there is a TMDL for the lake or basin in which the unit is found.	for maintaining water quality? <i>Answer YES</i> Yes = 2 No = 0	
Total for L 3	Add the points in the boxes above	-

Rating of Value | If score is:___2-4 = H ___1 = M ___0 = L

LAKE FRINGE WETLANDS		
Hydrologic Functions - Indicators that the wetland unit functions to	reduce shoreline erosion	
L 4.0. Does the site have the potential to reduce shoreline erosion?		
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (do no Choose the highest scoring description that matches conditions in the wetland.	ot include Aquatic bed):	
> ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 6	
> ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide	points = 4	
> ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide	points = 4	
Plants are at least 6 ft (2 m) wide (any type except Aquatic bed)	points = 2	
Plants are less than 6 ft (2 m) wide (any type except Aquatic bed)	points = 0	
Rating of Site Potential: If score is:6 = M0-5 = L	Record the rating on the fin	st page
L 5.0. Does the landscape have the potential to support the hydrologic functions of t	he site?	
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5 Add the po	ints in the boxes above	
Rating of Landscape Potential If score is:2 = H1 = M0 = L	Record the rating on the fir	st page
L 6.0. Are the hydrologic functions provided by the site valuable to society?		
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one choose the one with the highest score.	resource is present,	
There are human structures or old growth/mature forests within 25 ft of OHWM of the	shore in the unit	
	points = 2	
There are nature trails or other naths and recreational activities within 25 ft of OHWM	points = 1	

Rating of Value: If score is:__2 = H ___1 = M ___0 = L

Other resources that could be impacted by erosion

There are no resources that can be impacted by erosion along the shores of the unit

Record the rating on the first page

points = 1

points = 0

NOTES and FIELD OBSERVATIONS:

SLOPE WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every	
100 ft of horizontal distance)	
Slope is 1% or less points = 3	
Slope is > 1%-2% points = 2	
Slope is > 2%-5% points = 1	
Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions): Yes = 3 No = 0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants:	
Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you	
have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher	
than 6 in.	
Dense, uncut, herbaceous plants > 90% of the wetland area points = 6	
Dense, uncut, herbaceous plants > ½ of area points = 3	
Dense, woody, plants > ½ of area points = 2	
Dense, uncut, herbaceous plants > 1/4 of area points = 1	
Does not meet any of the criteria above for plants points = 0	
Total for S 1 Add the points in the boxes above	
Rating of Site Potential If score is:12 = H6-11 = M0-5 = L Record the rating of the score is:12 = H6-11 = M0-5 = L	the first page
S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?	
Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	
Other sources Yes = 1 No = 0	
Total for S 2 Add the points in the boxes above	
Rating of Landscape Potential If score is:1-2 = M0 = L Record the rating of t	n the first page
S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the	
303(d) list? Yes = 1 No = 0	
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin	is
on the $303(d)$ list. Yes = 1 No = 0	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES	
if there is a TMDL for the basin in which unit is found. Yes = 2 No = 0	
Total for S 3 Add the points in the boxes above	
Rating of Value If score is:2-4 = H1 = M0 = L Record the rating of Value If score is:2-4 = H1 = M0 = L	n the first page

Wetland name or number _____

SLOPE WEILANDS	
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream ero	sion
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > \frac{1}{8} in), or dense enough, to remain erect during surface flows. Dense, uncut, rigid plants cover > 90% of the area of the wetland points = 1 All other conditions	
Rating of Site Potential If score is:1 = M0 = L Record the rating on	the first page
S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = $1 \text{ No} = 0$	
Rating of Landscape Potential If score is:1 = M0 = L Record the rating on	the first page
S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or	
natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream points = 0	
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for S 6 Add the points in the boxes above	
Rating of Value If score is:2-4 = H a1 = M a0 = L Record the rating on	the first page

NOTES and FIELD OBSERVATIONS:



These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat H 1.0. Does the site have the potential to provide habitat? H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked. 4 structures or more: points = 4 Aquatic bed 3 structures: points = 2 Emergent Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1 1 structure: points = 0 Forested (areas where trees have > 30% cover) If the unit has a Forested class, check if: The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods). 4 or more types present: points = 3 Permanently flooded or inundated Seasonally flooded or inundated 3 types present: points = 2 Occasionally flooded or inundated 2 types present: points = 1 Saturated only 1 type present: points = 0 Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland 2 points Lake Fringe wetland 2 points Freshwater tidal wetland H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle If you counted: > 19 species points = 2 points = 1 5 - 19 species < 5 species points = 0 H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. Moderate = 2 points None = 0 points Low = 1 pointAll three diagrams in this row are HIGH = 3points

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). Standing snags (dbh > 4 in) within the wetland	
Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed)At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians)Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)	2
Total for H 1 Add the points in the boxes above	~
Rating of Site Potential If score is:15-18 = H	t page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit). Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] = % if total accessible habitat is: > \(^1/_3\) (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] =% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: If $> 50\%$ of 1 km Polygon is high intensity land use $\leq 50\%$ of 1 km Polygon is high intensity points = 0	2
Total for H 2 Add the points in the boxes above	<u>) </u>
Rating of Landscape Potential If score is:4-6 = H1-3 = M	page
H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only the highest score that applies to the wetland being rated. Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above	2

Site does not meet any of the criteria above

Rating of Value If score is: 2 = H ___1 = M ___0 = L

WDFW Priority Habitats

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: *NOTE:* This question is independent of the land use between the wetland unit and the priority habitat.

- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests: Old-growth west of Cascade crest Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158 see web link above).
- **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (full descriptions in WDFW PHS report p. 161 see web link above).
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report see web link on previous page*).
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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APPENDIX C ROWLEY DEVELOPMENT AGREEMENT – APPENDIX J

APPENDIX J – Critical Area Regulations

Section 1.0	Purpose
Section 2.0	Intent
Section 3.0	Environmentally Critical Areas
Section 4.0	Allowances
Section 5.0	Critical Area Intrusions
Section 6.0	Critical Area Studies
Section 7.0	Critical Area Protection Mechanisms, Buffer Areas and Building Setback Areas
Section 8.0	Temporary Marking – Permanent Marking – Signs
Section 9.0	Monitoring
Section 10.0	Critical Area Mitigation Fund
Section 11.0	Allowed Critical Area Activities
Section 12.0	Mitigation Plan Information Requirements
Section 13.0	Bonds for Restoration and Mitigation Activities
Section 14.0	Enforcement and Penalties for Critical Areas
Section 15.0	Civil Penalties
Section 16.0	Notices and Orders
Section 17.0	Criminal Penalties
Exhibit J-1	Critical Area Map
Exhibit J-2	Northern Enhancements
Exhibit J-3	Southern Enhancements
Exhibit J-4	Off-Site Enhancements
Exhibit J-5	Building Encroachment
Exhibit J-6	Interim 100' Line

1.0 Purpose

The purpose of this Appendix is to identify environmentally critical areas and to modify by agreement existing regulations in a manner which tailors their application and requires mitigation appropriate to this specific property, circumstance and unusual site conditions. In so doing, the parties intend to establish guidelines and regulations consistent with IMC 18.10.400.I but which allow for the consideration and implementation, upon a sufficient showing by the Master Developer, of alternative means of achieving like results.

The following buffer-related, specific current code provisions were utilized in the development of this Appendix:

- IMC 18.10.350 Intent.
- IMC 18.10.400.I Exemptions.
- IMC 18.10.640 Wetland buffer width requirements.
- IMC 18.10.650.A Exceptions to wetland buffer width requirements.

2.0 Intent

Any Critical Area regulations not specifically addressed in this Appendix are regulated by IMC 18.10. It is the intent of the City to balance the community vision which includes:

A. Environmental protection and preservation;

- B. Diversified, economic growth which has been planned and which is compatible with the vision of the community; and,
- C. Overall improvement of the quality of life for the residents of Issaquah.

Environmentally Critical Areas

- A. All known, non-exempt critical areas located within the Project boundaries are identified on the Critical Area Map (Exhibit J-1). There are no Critical Areas located within the Rowley Center neighborhood aside from the adjacent wetlands associated with SR900, located on property owned by WSDOT. The Hyla Crossing neighborhood contains additional SR900 wetlands located within WSDOT right-of-way, steep slopes adjacent to Newport Way NW, floodplain associated with Tibbetts Creek, and Tibbetts Creek stream and wetlands.
- B. No encroachments or disturbance shall occur within any Critical areas except for those listed in Sections 4.0 and 5.0 of this Appendix.

Allowances

The following activities are vested rights to the Master Developer with this Appendix and agreed to by the City to foster the redevelopment envisioned with this Agreement. These allowances require a City permit and must be accompanied by a Critical Area Study (unless otherwise noted) as provided for in Section 6.0 of this Appendix to ensure any impacts are minimized and mitigated.

- A. Emergencies that threaten the public health, safety and welfare as determined by the Master Developer and/or Designated Official are exempt and shall not be subject to any review and approval process;
- B. Non-vehicular Recreational Crossing(s) (up to 3) of Tibbetts Creek, provided there is no unmitigated wetland, stream or buffer impacts; and, added plantings, as directed by the Designated Official, shall be installed.
- C. Public water, electric and natural gas distribution, public sewer collection (sanitary & storm), cable communications, telephone utility, and other private utilities and related activities, with no practical location alternative, undertaken pursuant to City-approved best management practices and restoration for any disturbance.
- D. Relocation of Tibbetts Creek per **Exhibit J-4** to the west.
- E. Trails and outlooks within the Critical Area buffer as part of an approved Trails Plan
- F. Critical Area habitat enhancements (e.g. frog bridge, bird houses, bat boxes, etc.), shall not be subject to any review and approval process.
- G. Sediment removal within Tibbetts Creek as necessary to maintain flows with restoration of any disturbed areas, as directed by the Designated Official.

Critical Areas Intrusions.

Should proposed development lead to critical area intrusions not addressed in Section 4.0, the applicant shall provide a Critical Area Study as provided for in Section 6.0 of this Appendix. The provisions of Section 2.0 of this Appendix must be supported in order to be considered for approval. An application for a critical area intrusion shall be approved where the Master Developer demonstrates that, as mitigated, approval of the intrusion is consistent with the policies set forth in Section 2.0.

6.0 Critical Areas Studies

- A. Required: As determined by the Designated Official, an applicant for a development proposal that may, or could have probable adverse impacts to critical areas shall submit a critical areas study for all non-exempted critical area actions, to adequately evaluate the proposal and all probable impacts. The need for a critical areas study shall be determined through:
 - 1. Review of the SEPA decision for the Project;
 - 2. Agency resource maps or studies; or
 - 3. At the request of the Designated Official after field investigation.
- B. Contents of Critical Areas Study: At a minimum a critical areas study shall be prepared at the applicant's expense, to identify and characterize any critical area as a part of the larger development proposal site; assess any hazards to the proposed development (e.g. flooding, steep slope instability, etc.); assess impacts of the development proposal on any critical areas located on or adjacent to the development proposal site; and assess the impacts of any alteration proposed for a critical area. Studies shall propose adequate mitigation, maintenance and monitoring plans and bonding measures. Critical areas studies shall include among other requirements, a scale map of the development proposal site and a written report. The following criteria identified within Subsection C are the basic requirements for a critical areas study. However, the Designated Official may request additional information if warranted by the specific request.
- C. Required Notice: all Critical Area Studies shall be displayed on the City's webpage with other permit tracking information. Contents shall include:
 - 1. Vicinity Information:
 - a. A description and maps at a scale no smaller than one (1) inch = fifty (50) feet (unless otherwise approved by the Designated Official), showing the entire parcel of land owned by the applicant; adjacent area; and the exact boundary of the critical area on the parcel as determined in compliance with appropriate section of this appendix. Maps can be overlaid on aerial photographs;
 - b. For parcels containing wetlands, the study must include the location and description of the existing vegetative cover, including dominant species of the regulated wetland and adjacent area.

2. Plan:

- a. A plan for the proposed activity at a scale no smaller than one (1) inch = twenty (20) feet (unless otherwise approved by the Designated Official), showing the location, width, depth and length of all existing and proposed structures, roads, sewage treatment, and installations to be located within the critical area and/or its
- b. The exact sizes and specifications for all regulated activities including the amounts and methods.
- 3. Project Description:
 - a. The purposes of the project and an explanation why the proposed activity cannot be located at another location on the project site, including an explanation of how the proposed activity is dependent upon the chosen specific location; and,
 - b. Specific means to mitigate any potential adverse environmental impacts of the applicant's proposal.
- 4. Additional Information:

The Designated Official may as appropriate require the following additional information to address a specific concern:

- Topographic map, including elevations of the site and adjacent lands within the critical area and its buffer at contour intervals as specified by the Designated Official but in most cases no greater than five (5) feet;
- Elevations and cross sections: b.
- Assessment of critical area functional characteristics including but not limited to a C. discussion of the methodology used and documentation of the ecological, aesthetic, economic, or other values of the critical area;
- d. A study of natural hazards at the site and the effect of any protective measures that might be taken to reduce such hazards;
- A Biological Assessment as required by Section 7(c) of the Endangered Species e.
- f. Lighting impacts on adjacent wetland or stream critical areas; or,
- Any other information deemed necessary to verify compliance with the provisions of this Appendix or to evaluate the proposed use in terms of the purposes of this Appendix.
- D. The Designated Official shall circulate the critical areas study to any affected City Departments or other entities, as deemed appropriate, such as, the Public Works Department and the River and Streams Board.
- E. The Designated Official shall make a final decision regarding the adequacy of the critical areas study.
- F. No construction may occur prior to the issuance of a decision on the Critical Area Study and all necessary land use and/or utility permits.

7.0 Critical area protection mechanisms, buffer areas and building setback areas

All Critical Areas shall be protected pursuant to this <u>Section 7.0</u>.

- A. Protection Mechanisms for Critical Areas
 - 1. There are two mechanisms for protecting critical areas: tracts and easements. The Designated Official will have the discretion to determine which mechanism shall be used to protect critical areas. In general the following can be used as guidance for using these mechanisms:
 - a. Large critical areas will be placed in tracts.
 - Smaller critical areas will be restricted by easements. These easements will permit the broader uses allowed in critical area tracts.
 - 2. Critical Area Tracts: Critical area tracts shall be used to protect critical areas in proposals for subdivisions or other development proposals to which they apply, and shall be recorded on all documents of title of record for all affected lots.
 - Critical area tracts are legally created tracts containing critical areas and their buffers that shall remain undeveloped in perpetuity. Critical area tracts are an integral part of the larger parcel in which they are created, are dedicated or recorded at Final Plat or prior to Building Permit issuance and are not intended for future sale, lease or transfer. Permanent survey stakes using iron or cement markers as established by current survey standards shall be set delineating the boundaries between adjoining properties and the critical area tracts.

- Ownership: Critical Area tracts shall not be individually owned, but shall be dedicated to the Master Association or other appropriate organization as approved by the Designated Official. In some circumstances, the City may consider ownership of the tracts, at their discretion.
- Allowed Uses: Permitted uses in these tracts shall be consistent with this Appendix, and approved by the Designated Official.
- 3. Conservation Easements: Conservation Easements shall be used to protect critical areas on portions of private property containing critical areas where a critical area tract is not created. The easements shall be recorded on all documents of title of record for all affected parcels.
 - Conservation Easements are legally created restrictions containing critical areas a. and their buffers that shall remain undeveloped so long as the protection is needed. These easements are an integral part of the larger parcel in which they are created, are dedicated at Final Plat or prior to Building Permit issuance and are not intended for future sale, lease or transfer.
 - Ownership: Conservation easements shall be dedicated to the Master Association b. or other appropriate organizations as approved by the Designated Official. In some circumstances, the City may consider being the recipient of the easement, at their discretion.
 - c. Allowed Uses: Permitted uses in these easements shall be consistent with this Appendix, and approved by the Designated Official.
- B Buffer Areas: Buffer areas shall be established from the outer edge of the critical area and based on the minimum buffer requirements set forth in the appropriate section of this Appendix.
 - 1. Tibbetts Creek and associated wetlands buffers will vary in width based on a Specific Critical Area Plan (generally illustrated as Exhibit J-1). The Plan will be developed recognizing the site is a combination of prior improvements and currently non-conforming creek and wetland buffers. The Plan will include the filling of a portion of the creek and wetlands and the creation of replacement creek and wetlands areas, buffer widenings and buffer enhancements. More specifically, the Plan will include the following:
 - a. Tibbetts Creek Greenway completed improvements (Wetlands C and D, approximately 2.5 acres) have provided benefits for creek capacity, water quality and fish and wildlife habitat for Tibbetts Creek in this geographic location.
 - b. On-site Enhancements
 - 1. Southern Enhancements (**Exhibit J-3**): completed prior to occupancy of any redevelopment of parcels 7450900380, 7450900370 or 7450900360.
 - 2. Southern Enhancements will establish a 100-foot buffer (averaged) and an additional 1.1 acres of critical area within the Creek.
 - 3. Northern Enhancements (Exhibit J-2): completed prior to occupancy of 1,000,000 of Allowable Development within the Hyla Neighborhood
 - 4. Northern Enhancements: will establish a 100-foot averaged buffer east of the Creek and add 0.6 acres of critical area at the northernmost end of the Project.
 - c. Off-site enhancements
 - 1. Off-site Opportunity (**Exhibit J-4**, approximately 5 acres) the Master Developer and the City shall work to obtain control over the off-site property to relocated Tibbetts Creek to the west either through obtaining fee title or a

- conservation easement. The project will include filling a portion of the existing creek and wetlands combined with the creation of replacement creek and wetlands.
- 2. The Master Developer shall be responsible for land costs, developing the Creek enhancement and relocation plan per the Tibbetts Greenway Plan. Upon property control, the Master Developer may apply for and obtain all local and State permits necessary to implement such plan.
- 3. The City will, if necessary, assist in property acquisition.
- 4. Timing: Due to the uncertainty of Master Developer's ability to acquire title and/or otherwise obtain permission and/or permit approvals to conduct this off-site critical area work, Master Developer shall retain a portion of its developable property (as illustrated in Exhibit J-6) to be utilized as potential additional critical area buffer if the creek relocation as described in Subsection 2 above cannot be accomplished. This limitation is further described in Subsection 5 below.
- 5. Until such time as the off-site enhancements depicted in Exhibit J-4 are completed, Master Developer shall neither construct any new structures nor expand any existing structures within one hundred feet (100') of that portion of Tibbetts Creek (in its current location) adjacent to and between the southerly face of Building 15 (as depicted in Figure 3.2-1 of the Hyla Crossing and Rowley Center Project FEIS) to the northerly boundary of Master Developer's ownership adjacent to I-90. Nothing herein shall prohibit Master Developer from expanding any existing building where such expansion occurs outside of such 100 foot buffer.
- d. Limited Building Encroachment (Exhibit J-5)
 - 1. Maximum 2 locations
 - 2. Location: vicinity of Maple and 19th Avenue
 - 3. Maximum Encroachment: 200 linear feet, within 25 feet (10 foot buffer and 15 foot Building Setback Area) of Tibbetts Creek with a minimum vertical clearance of 12 feet (2nd Story and above)
 - 4. Limitation: Mid-Rise or High-Rise Structure only
 - 5. Required: Critical Area Study and necessary buffer mitigation including buffer replacement.
- e. Building Setback Area

Unless otherwise allowed in this Section 7.B or 7.C, a 15-foot Building Setback Area shall apply.

- 2. I-90 and SR900 wetlands would be maintained per existing conditions, unless wetlands are relocated through future actions.
- 3. Steep Slopes toe and top of slopes shall be determined through a geo-technical evaluation with City peer review.
- 4. Restrictions due to the presence of Seismic hazards will be evaluated at Utility and Building Permit review.
- 5. Where more than one critical area buffers overlap, the largest buffer width shall be applied to ensure adequate protection for each critical area.
- 6. Reduction: unless otherwise specifically allowed, a critical area buffer may be reduced if the following apply:

- a. A critical area study indicates the buffer may be reduced without resulting in impacts to the critical area.
- b. The reduction may be fully mitigated through additional plantings, buffer increase elsewhere or other means, as approved by the Designated Official.
- 7. Buffer Averaging: Standard critical area buffers may be modified by averaging buffer widths if approved by the Designated Official as part of the Critical Area Study submitted either with, or prior to, the development application. Buffer width averaging is anticipated for the Project and shall be allowed within all wetland classes where the applicant demonstrates the following:
 - a. That width-averaging will not adversely impact the wetland functional values;
 - b. That the total area contained within the wetland buffer after averaging is no less than that contained within the standard buffer prior to averaging, except in the following situations: The Designated Official may consider relocation of averaged buffer to the buffer of other wetlands; and,
 - c. Areas already protected by these Critical Area Regulations including the specific critical area or the required buffer, may not be used for buffer averaging credit.
- C. Building Setback Areas: Building setback areas shall be established from the outer edge of the critical area buffer.
 - 1. The minimum building setback area shall be fifteen (15) feet unless a reduction of this standard meets the following criteria and is approved by the Designated Official:
 - a). The intrusion can be shown, through a critical area study which assumes implementation of appropriate mitigation, to have no adverse impact on the critical area;
 - b). Construction techniques can be utilized that reasonably ensures no adverse impact to the critical area or buffer during construction activities;
 - c). Design of the site and building(s) and, placement of the building(s) allow adequate physical and visual separation from nearby uses and are sensitive to the critical area; and,
 - d). An area equal to 2(x) the intrusion shall be provided within the building setback area as pervious open space. This area shall be landscaped to be compatible with the adjoining critical area, as determined by the Designated Official.
 - 2. Prohibitions on the use of hazardous or toxic substances and pesticides or certain fertilizers in this area shall be imposed for setbacks from streams and wetlands.
 - 3. Minor structural intrusions (e.g. patios, sidewalks, roads, rockeries and walls less than 4 feet in height) into the area of the building setback may be allowed if the applicant proves to the Designated Official that such intrusions will not negatively affect the protection level provided by the buffer to the critical area.
 - 4. Balconies located more than 30 feet above adjacent grade may extend into the Building Setback Area, subject to the applicant demonstrating to the Designated Official that the intrusions will not adversely impact the critical area.
 - 5. The building setback area shall be illustrated on all implementing preliminary plats and final plats, site development permits, building permit site plans, and similar type of permits containing or adjacent to critical areas.

8.0 Temporary marking - Permanent survey marking - Signs

- A. Temporary Marking: The location of the outer extent of the critical area buffer and building setback line pursuant to an approved Development or Land Use Permit shall be marked in the field with orange construction fencing and/or other appropriate apparatus, as determined by the Designated Official during critical area review. The location and presence of such markings in the field shall be approved by the Designated Official, prior to the commencement of permitted activities. Such field markings shall be maintained throughout the duration of the construction activities.
- B. Survey Markers: Permanent survey stakes using iron or cement markers as established by current survey standards shall be set delineating the boundaries between adjoining properties and the critical areas tracts.
- C. Signs: Boundaries between critical area tracts and/or areas with conservation easements and adjacent lands shall be identified using permanent signs explaining the type and value of the critical area, except the portions, if any, of a critical area that are adjacent to natural or wild areas. Whenever a trail enters a critical area buffer, the boundary shall be identified using permanent signs explaining the type and value of the critical area. The number of signs required by the Designated Official will be dependent upon the size of the critical areas and the use of the property.

9.0 Monitoring

- A. The Designated Official shall require monitoring when mitigation is required for the alteration of a critical area and its buffer.
- B. Frequency, detail and length of monitoring by the applicant will be included in the Mitigation Plan or the Critical Area Decision.
- C. Where monitoring reveals a significant deviation from predicted impacts or a failure of mitigation measures, the applicant shall be responsible for appropriate corrective action which, when approved, shall be subject to further monitoring by the applicant.

10.0 Critical Areas Mitigation Fund

There is hereby created a Critical Areas Mitigation Fund which shall be administered by the Finance Department. All funds received from civil penalties resulting from violations of this appendix shall be deposited in the fund which shall be used only for the purpose of paying all or part of the cost and expense of enforcing and implementing this Appendix. Monies in said fund not needed for immediate expenditure shall be invested for the benefit of Critical Areas located within the Project; or, as otherwise directed by the Master Developer.

11.0 Allowed Critical Area Activities

- A. The following activities shall be allowed within a critical area and buffer to the extent that they are not prohibited by any other ordinance or law and provided they are conducted using best management practices, except where such activities result in the conversion of a regulated critical area and buffer to an activity to which it was not previously subjected. Further that forest practices and conversions shall be governed by Chapter 76.09 RCW and its rules.
 - 1. Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife;
 - 2. Outdoor recreational activities, including fishing, trail activities & bird watching;
 - 3. The noncommercial harvesting of wild vegetation in a manner that is not injurious to the critical area and provided the harvesting does not require tilling of soil, planting of crops,

- or alteration of the wetland by changing existing topography, water conditions or water sources:
- 4. Education, scientific research, and use of designated trails;
- 5. Normal or emergency maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas. Maintenance and repair does not include any modification that changes the character, scope, or size of the original structure, facility, or improved area and does not include the construction of a maintenance road;
- 6. Minor modification of existing serviceable structures (e.g. utilities, monitoring equipment, etc.) within a buffer where modification does not adversely impact wetland functions; and
- 7. Site investigative work necessary for land use application submittals such as delineations, surveys, soil logs, percolation tests and other related activities; and,
- 8. Removal of invasive or non-native vegetation or installation of habitat or water quality enhancing vegetation.
- B. In critical area buffers, regulated activities which have minimal adverse impacts within the buffers and no adverse impacts on wetlands may be allowed through the Land Use Permit process, provided they are conducted using best management practices. These activities include:
 - 1. Low-intensity, passive recreation-related activities such as development of recreation trails & outlooks, nonpermanent wildlife watching blinds, short-term scientific or educational activities:
 - 2. Stormwater management facilities having no feasible alternative on-site locations, where appropriate mitigation in the form of restoration and/or enhancement is included, and which would not adversely affect the function or values of the buffer or wetland. Any buffer area displaced by a stormwater management facility shall be compensated for by adding buffer area so that no net loss of buffer area results from the placement of the facility. However, dispersion trenches (with prior approval by the Designated Official) which support wetland or stream water flows, do not require compensatory mitigation; and,
 - 3. Surface water discharge to a critical area or buffer from a detention facility, pre-settlement pond or other surface water management activity or facility may be allowed if the discharge enhances the critical area and/or does not increase the rate of flow, change the plant composition in a critical area, or decrease the water quality of the wetland or stream.

12.0 Mitigation plan information requirements

A required mitigation plan shall be prepared in consultation with the Designated Official and qualified professionals. The scope and specific requirements of a mitigation plan are dependent on the size and nature of the development proposal, and, the nature of the impacted critical area, the mitigation plan shall contain at a minimum the following components; however, the Designated Official may request additional information as required for the decision-making process:

- A. Identification of Project Team: A Compensation Project Manager shall be named and the qualifications of each team member involved in preparing the mitigation plan and implementing and supervising the project shall be provided, including educational background and areas of expertise, training and experience with comparable projects.
- B. Baseline Information: A written assessment and accompanying maps of the environmental conditions of the impacted regulated wetland and the mitigation-site if different.
- C. Environmental Goals and Objectives: A written report shall be provided identifying goals and objectives of the mitigation plan. The goals and objectives shall be related to the functions and

- values of the original wetland or if out-of-kind, the type of wetland to be emulated and an analysis of the likelihood of success of the created or restored wetland.
- D. <u>Evaluation Criteria</u>: Specific criteria, including ecological, geological, or hydrological criteria, shall be provided for evaluating whether or not the goals and objectives of the project will be met and whether or not remedial action or contingency measures should be initiated.
- E. <u>Detailed Landscape Construction Plans</u>: Drawings and written specifications describing the mitigation techniques and materials to be used.
- F. <u>Monitoring Program</u>: A program outlining the approach for monitoring construction of the compensation project and for assessing a completed project shall be provided, including a protocol of how the monitoring data will be evaluated by agencies that are tracking the progress of the mitigation project.
- G. <u>Contingency Plan</u>: Identification of potential courses of action, and any corrective measures to be taken when monitoring or evaluation indicates project performance standards are not being met.

13.0 Bonds for restoration and mitigation activities

- A. Performance Bonds: Mitigation required pursuant to a development or utility proposal must be completed prior to the Designated Official's granting of final approval of the development proposal or utility permit. If the applicant demonstrates that seasonal requirements or other circumstances beyond its control prevent completion of the mitigation prior to final approval, the applicant may post a performance bond equal to one hundred fifty (150) percent of the total cost of the unfinished mitigation project to complete, or other security instrument approved by the Designated Official which guarantees that all required mitigation measures will be completed no later than the time established by the Designated Official in accordance with this Appendix.
- B. <u>Maintenance/Monitoring Bonds</u>: The Designated Official shall require the applicant whose development proposal is subject to a mitigation plan to post a maintenance/monitoring bond equal to fifty (50) percent of the estimated maintenance and monitoring cost, or other security instrument approved by the Designated Official in an amount determined sufficient to guarantee satisfactory workmanship, materials, and performance of structures and improvements allowed or required by this appendix for a period of five (5) years.
- C. Performance and maintenance/monitoring bonds or other security instruments shall also be required for restoration of a critical area not performed as part of a mitigation plan, except no bond shall be required for minor stream restoration carried out pursuant to this Appendix.
- D. Bonds or other security instruments shall be in a form and amount approved by the Designated Official and the City Attorney and shall remain in effect until the Designated Official determines in writing that performance and maintenance standards have been met.
- E. <u>Enforcement of Bonds</u>: Depletion, failure, or collection of bond funds shall not discharge the obligation of an applicant or violator to complete required mitigation or restoration.

14.0 Enforcement and penalties for critical areas

A. The enforcement provisions for critical areas are intended to encourage compliance and protect critical areas and the public from harm. To achieve these ends, violators will not only be required to restore damaged critical areas, insofar as that is possible, but will also be required to pay a civil penalty for the redress of ecological, recreational, and economic values lost or

- damaged due to their unlawful action. The provisions in this section are in addition to, and not in lieu of, any other penalty, sanction or right of action provided by law.
- B. Each violation of this Appendix, or any rule or regulation adopted, or any permit, permit condition, or order issued pursuant to this Appendix, shall be a separate offense, and, in the case of a continuing violation, each day's continuance shall be deemed to be a separate and distinct offense.
- C. Any person incurring a penalty may apply in writing within thirty (30) calendar days of receipt of the penalty to the Designated Official for remission or mitigation of such penalty. Upon receipt of the application, the Designated Official may remit or mitigate the penalty only upon a demonstration of extraordinary circumstances, such as the presence of information or factors not considered in setting the original penalty.
- D. All costs, fees, and expenses in connection with enforcement actions may be recovered as damages against the violator.
- E. Aiding or Abetting: Any person who, through an act of commission or omission procures, aids or abets in the violation shall be considered to have committed a violation for the purposes of the penalty.
- F. The Designated Official may bring appropriate actions at law or equity, including actions for injunctive relief, to ensure that no uses are made of critical areas or their buffers that are inconsistent with this Appendix.

15.0 Civil penalties

- A. Any person in violation of this appendix shall be subject to civil penalties assessed as follows:
 - 1. An amount reasonably determined by the Designated Official to be equivalent to the economic benefit that the violator derives from the violation as measured by the greater of the resulting increase in market value of the property or the value received by the violator, or savings of construction costs realized by the violator performing any act in violation of this Appendix.
 - 2. An amount, not to exceed \$25,000, that is reasonably based upon the nature and gravity of the violation and the cost to the City of enforcing this Appendix against the violator.
 - 3. Penalties under this section shall be imposed by a notice in writing, either by certified mail with return receipt requested or by personal service, to the person incurring the same from the City. The notice shall describe the violation, approximate the date(s) of violation, and shall order the acts constituting the violation to cease and desist, or, in appropriate cases, require necessary corrective action within a specific time.
 - 4. Any civil penalty recovered under this section shall be deposited in the Critical Areas Mitigation Fund for use by the City in protecting or restoring critical areas that are part of the Project or as otherwise directed by the Master Developer.
 - 5. No civil penalty shall be imposed under this Appendix upon the Designated Official, or City employees for any act or omission relating to the administration or enforcement of this Appendix.

16.0 Notices and orders

The Designated Official is authorized to issue violation notices and administrative orders, levy fines, and/or institute legal actions in court.

A. Recourse to any single remedy shall not preclude recourse to any of the other remedies.

- B. The Designated Official may serve upon a person a cease and desist order if an activity being undertaken on a critical area or its buffer is in violation of this appendix or related Designated Official's decision. Whenever any person violates this appendix or any permit issued to implement this appendix, the Designated Official may issue an order reasonably appropriate to cease such violation and to mitigate any environmental damage resulting therefrom.
 - 1. The order shall set forth and contain:
 - a. A description of the specific nature, extent, and time of violation and the damage or potential damage; and,
 - b. A notice that the violation or the potential violation cease and desist or, in appropriate cases, the specific corrective action to be taken within a given time. A civil penalty may be issued with the order.
 - 2. The cease and desist order issued under this section shall become effective immediately upon receipt by the person to whom the order is directed.
 - 3. Failure to comply with the terms of a cease and desist order can result in enforcement actions including, but not limited to, the issuance of a civil penalty.
 - 4. Orders and penalties issued pursuant to this subsection may be appealed.
- C. Any person who undertakes any activity within a critical area or its buffer without first obtaining a permit required by this Appendix, except as allowed in each section under the allowed activities provision, or any person who violates one (1) or more conditions of any permit required by this Appendix or of any order issued pursuant to subsection (C)(2) of this section, shall incur a penalty allowed per violation.
 - 1. In the case of a continuing violation, each permit violation and each day of activity without a required permit shall be a separate and distinct violation.
 - 2. The penalty amount shall be set in consideration of the previous history of the violator and the severity of the environmental impact of the violation.
 - 3. Penalties provided from this section shall be appealable to King County Superior Court.

17.0 Criminal penalties

As an alternative to any other judicial or administrative remedy provided in this Appendix or by law or other ordinance, any person who willfully or knowingly violates any provision of this Appendix, or any order issued pursuant to this Appendix, or by each act of commission or omission procures, aids or abets such violation, is guilty of a misdemeanor and upon conviction shall be punished by a fine not to exceed \$1,000 and/or imprisonment in the City jail for a term not to exceed ninety (90) days. Each day such violation continues to occur, shall be considered an additional misdemeanor offense.

Exhibit J-1 Wetlands & Tibbetts Creek

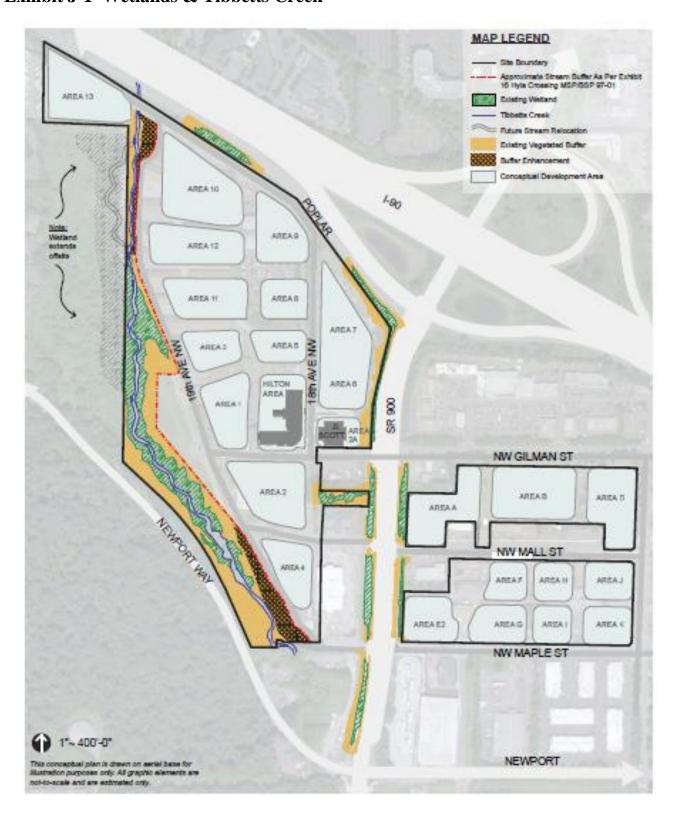


Exhibit J-2 Northern Enhancements

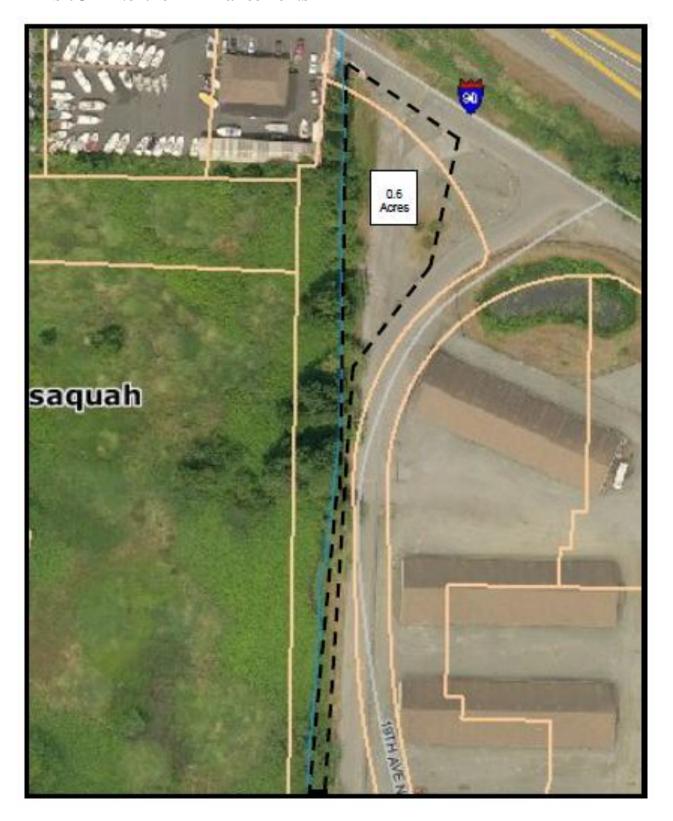


Exhibit J-3 Southern Enhancement Area



Exhibit J-4 Off Site Improvements

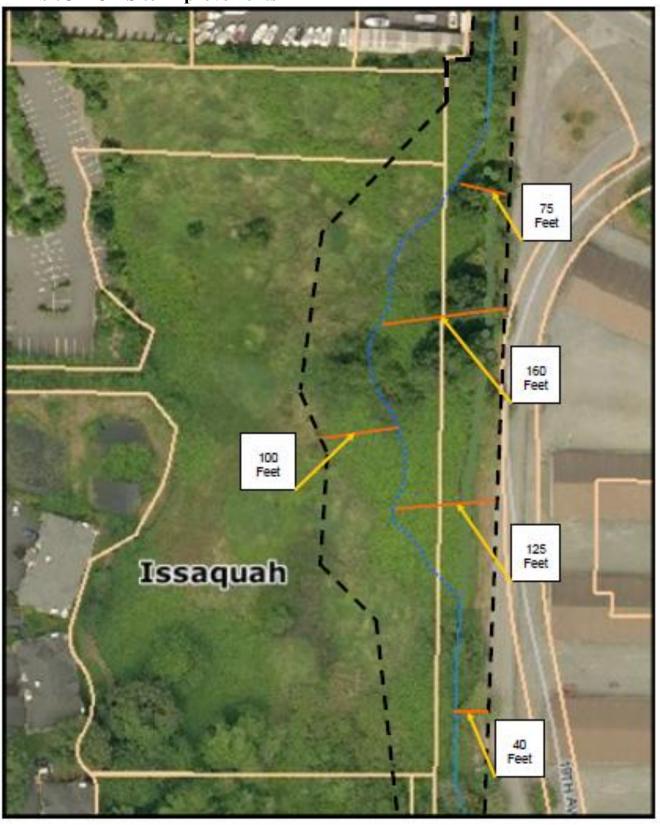
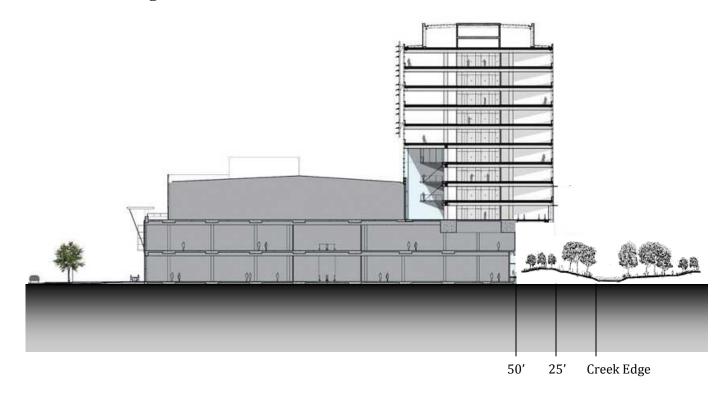


Exhibit J-5 Building Encroachment



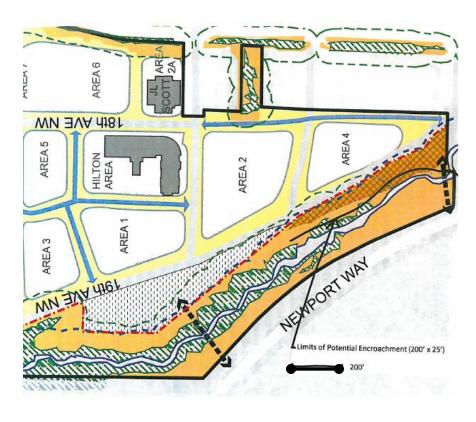


Exhibit J-6 Interim 100' line from Tibbetts Creek



APPENDIX D KELLER FARM MITIGATION BANK USE OVERVIEW

Introduction

Suggested text for this section is:

Background

The **Project Name** is located within the Service Area of the Keller Farm Mitigation Bank (KFMB). The project applicant is requesting that mitigation credits from KFMB be used to compensate for impacts to critical and buffer areas (or **describe specific impacts**) associated with the project. This Bank Use Plan describes the rationale for purchasing credits at the Keller Farm Mitigation Bank to compensate for impacts, and was prepared following agency guidance on preparing mitigation plans and the use of mitigation banks including: the Interagency Review Team for Washington State Guidance Paper on *Using Credits from Mitigation Banks: Guidance to Applicants on Submittal Contents for Bank Use Plans* (2009), Washington State's Mitigation Banking Statutes (RCW 90.84 and WAC 173-700), the Washington State Department of Ecology's (Ecology) *Wetland Mitigation in Washington State* (2006), and the U.S. Army Corps of Engineers (Corps) *Compensatory Mitigation for Losses of Aquatic Resources* (33 C.F.R. § 332)(2008).

The Keller Farm Mitigation Bank is a 75-acre certified mitigation bank located, in Redmond, WA. The Bank location is shown in Figure 1. The Bank Service Area is shown in Figure 2. KFMB is an "urban" bank that provides mitigation opportunities for urbanizing areas in east King County and south Snohomish County. KFMB was certified by federal, state, and local regulatory agencies in December 2019 and has mitigation credits available to compensate for approved impacts to wetlands and other critical areas including wetland and stream buffers and riparian areas.

As stated in the Appendix A of the Mitigation Banking Instrument for the KFMB, the purpose of the Bank is to generate mitigation credits for projects that will have an adverse impact on the aquatic environment and that need to compensate for those impacts as a condition of their permits or other regulatory requirements resulting from project impacts. The Bank site, known locally as "the Keller Farm", has been identified as a high priority restoration site since the 1990s and was specifically identified as a potential mitigation bank site in the Final Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan (2005). The Bank site was identified as a "Near Term Action" important to regional salmonid habitat restoration efforts as part of the Lake Washington/Cedar/Sammamish Salmon Conservation Plan for Water Resource Inventory Area (WRIA) 8, adopted by the National Oceanic and Atmospheric Administration (NOAA) and implemented by local stakeholders to achieve Chinook salmon recovery consistent with the Endangered Species Act (Chinook Salmon Conservation Plan, 2005; ESA 16 U.S.C. S 1531).

Restoration goals at KFMB address the limiting factors in the watershed related to loss of wetland habitat and riparian vegetation communities, and alterations to floodplain and stream habitat.

Consultant Qualifications

<u>List project team consultants and describe Consultant Qualifications to complete the Bank Use plan.</u>

Project Description

Provide a description of the development project including location, Service Area to be used, and justification for using Service Area, the types of activities that will impact wetlands, streams, or buffers and a general description of those impacts. If a detailed project description is available in other documents in the application package, summarize the project description and cite the more detailed documents.

The specific critical area impact must be allowed to be mitigated in the Service Area where the impact site is located. The notes on Figure 2 describes the types of critical areas impacts that can be mitigated within each Service Area.

Existing Conditions

Describe existing conditions of the proposed project site including existing and surrounding land uses, landscape position, vegetation, soils, hydrology, and existing conditions of critical areas present (wetlands, streams, buffers). Cite more detailed documents as appropriate, such as critical areas reports prepared for the project.

Avoidance and Minimization of Impacts

Describe how adverse impacts, both direct and indirect, to wetlands, streams, and buffers, as appropriate, will be avoided and minimized by the project to the greatest extent practicable. This should include consideration of project location, design, construction practices, monitoring efforts and/or other relevant factors. Cite more detailed documents as appropriate, such as critical areas reports prepared for the project.

If other sites were considered and rejected on the basis of critical area or buffer impacts or other environmental impacts, briefly mention them here. If a Clean Water Act Section 404(b)(1)

Alternatives Analysis is required (see https://www.epa.gov/cwa-404/memorandum-appropriate-level-analysis-required-evaluating-compliance-cwa-section-404b1 and

https://www.nws.usace.army.mil/Portals/27/docs/regulatory/Forms/Alternative%20Analysis%2 0Guidance%20Enclosure%20(10-23-03).pdf for information on alternatives analysis) or a Floodplain Habitat Assessment (see https://www.fema.gov/media-

 $library/assets/documents/161009 \ and \ https://www.fema.gov/media-library-data/1383598118060-$

e34756afe271d52a0498b3a00105c87b/Puget_Sound_R10_Habitat_Assess_guide.pdf for more information), please cite those documents here.

If site-specific measures were used adjacent to specific wetlands etc., a table similar to the following example may be useful:

Example Table 1
Avoidance and Minimization Measures

Wetland Identifier	Total Wetland Area (acres)	Potential Fill in Wetland Prior to Avoiding and Minimizing (acres)	Proposed Fill in Wetland (acres)	Avoidance and Minimization
A	1.01	0.08	0.03	Stormwater outfall designed to minimize impacts to wetland.
В	0.46	0.46	0.46	Impacts unavoidable – no practicable methods for reducing wetland impacts in this area while still meeting project goals for improved safety.
c	5.88	2.43	0.95	A retaining wall will be constructed along the entirety of this wetland to avoid and minimize impacts. A new ecology embankment will be constructed that will extend the wall an additional 10 feet to the west. This additional 10 feet is required to meet the flow (head) requirements to allow the ecology embankment to function properly.
D	2.43	0.40	0	Impacts to wetland avoided entirely by changing road alignment to widen toward the median.
TOTALS	9.78	3.37	1,44	

Examples of impact avoidance/minimization for several types of development include:

- Commercial facility: Minimizing new impervious surface, using pervious surfaces for parking lots, using infiltration to treat stormwater, enhancing wetland buffers, providing appropriate water quality treatment, reducing the project footprint from the original proposal, using native landscape plants, using integrated pest management techniques, using other low impact development measures, and others.
- Road Widening: widening asymmetrically to avoid wetlands, widening toward the road median, using retaining walls to reduce side slopes, minimizing new impervious surface by lane re-striping, using road shoulder-installed filters for water quality treatment, locating stormwater treatment facilities outside of wetlands, and others.
- Residential Development: Retaining native vegetation where possible, infiltrating roof runoff, using pervious surfaces for driveways, using other low impact development measures, enhancing wetland buffers, and others.

Unavoidable Wetland, Stream or Buffer Impacted Acreage

<u>Describe</u> adverse impacts, both direct and indirect, to wetlands, streams, and buffers. Summarize the areal impacts using a table similar to the following examples. Cite corresponding drawings in the application package or append to the Bank Use Plan.

Example tables:

Expected Impacts to Wetlands

Wetland Identifier	Wetland Area (acres)	Permanently Filled Wetland Area (acres)	Temporarily Impacted Wetland Area (acres)	Indirect Impact Area (acres)	Cowardin Classification	Ecology Rating	Local Jurisdiction Rating	HGM Classification
Α	1.01	0.03	0	0	PEM	IV	4	Depressional
В	0.46	0.46	0	0	PEM	IV	4	Depressional
С	5.88	0.95	0.52	0	PSS	Ш	3	Riverine
TOTALS	7.35	1.44	0.52	0				

Table 2. Summary of Wetland Impacts.

Impact Area	Category	Cowardin Class	HGM Class	Impact Type	Impact Amount
Wetland A	IV	Emergent	Slope	Direct (fill)	0.22 acres (9,622 sq. ft.)
Wolfand 71	1,		ыоре	Indirect (insufficient buffer)	0.44 acres (18,987 sq. ft.)
Wetland B	īV	Emergent	Slope	Direct (fill)	0.05 acres (2,190 sq. ft.)
Wettand B	IV.	Emergent	Stope	Indirect (insufficient buffer)	0.25 acres (10,985 sq. ft.)
Wetland C	IV	Emergent	Slope	Direct (fill)	0.03 acres (1,385 sq. ft.)
Wetland D	īV	Emergent	Slope	Indirect (insufficient buffer)	0.02 acres (817 sq. ft.)
Wettand D				Temporary (grading)	0.03 acres (1,156 sq. ft.)
Wetland D Buffer				Temporary (grading)	0.30 acres (13,111 sq. ft.)
Wetland E	IV	Emergent, Scrub-Shrub, Forested	Depressional	Indirect (insufficient buffer)	0.01 acres (594 sq. ft.)
Direct Total 13,197 sq. ft.					

Impacted Wetland, Stream, or Buffer Functions

<u>Describe the wetland or stream</u>) functions that are expected to be lost or altered. The discussion can be divided into groups of wetland functions such as water quality, hydrologic, and habitat.

If a more detailed function description is available in other documents in the application package, this section should simply summarize the functions that will be affected and cite the more detailed document. Use the Washington State Wetland Rating System (Hruby 2014) and submit the rating forms and accompanying maps/drawings for all wetland impact projects requiring a Section 401 Water Quality Certification. Rating methods for both western and eastern WA are available at: http://www.ecy.wa.gov/programs/sea/wetlands/ratingsystems/index.html). Applicants may use other wetland function assessments, in addition to the rating system, at their discretion, but they should not substitute for the Rating System.

If the project will entirely eliminate a wetland, then assume that all functions will be lost. If a wetland will be partially filled or otherwise affected, discuss the extent to which existing functions will be lost. Include a discussion of the potential indirect and/or temporary impacts to the remaining wetland, if any.

Note: Fill or clearing in a wetland buffer may result in indirect wetland impacts that could also require compensatory mitigation. Even temporary clearing of forested or shrub areas in wetlands or buffers may have long-term indirect impacts to wetlands and may require mitigation. Also, functions are not evenly distributed throughout a wetland. For example, a wetland may be mostly forested with some disturbed emergent patches along the edges. If the project will only fill those emergent patches, then habitat functions may be less affected than if forested areas were eliminated. However, in this example, indirect impacts to habitat in the forested areas may result and should be accounted for.

Water Quality Functions – Briefly describe characteristics of wetlands relative to water quality functions such as water movement, vegetation extent as it relates to potential for slowing and filtering water (e.g., extent of grazing), extent of ponding, opportunity to improve water quality and so on. Describe how these functions will be affected by the project.

Hydrologic Functions – Briefly describe characteristics of wetlands relative to the ability and opportunity of the wetland to store water. Describe how these functions will be affected by the project.

Habitat Functions – Briefly describe characteristics of wetlands relative to habitat functions such as interspersion of habitats, corridor connectivity, plant species richness, buffer condition, and so on. Describe how these functions will be affected by the project.

Mitigation Site Selection Rationale

Confirm that the project is located within the KFMB Service area (see service area text definitions)

The impact site must be within the approved Service Area of the KFMB (See Figure 2). Note there are two described Service Areas – Lake Sammamish and Lake Washington. Contact a KFMB representative if you have questions about the KFMB Service Areas.

The Lake Sammamish Sub-basins/Creeks included in the Lake Sammamish Service Area are:

- Issaquah Creek Sub-basin: Issaquah Creek, Carey Creek, Holder Creek, McDonald Creek, Fifteenmile Creek, Tibbetts Creek
- <u>Lake Sammamish Sub-basin: Laughing Jacobs Creek, Pine Lake Creek, Ebright Creek, George Davis Creek, Lewis Creek, Squibbs Creek, Vasa Creek</u>
- <u>Bear Creek Sub-basin: Bear Creek, Evans Creek, Rutherford Creek, Cottage Lake Creek, Mackey Creek, Colin Creek, Struve Creek</u>
- Sammamish River Sub-basin: Derby Creek, Gold Creek, Woodin Creek
- <u>Little Bear Creek Sub-basin: Little Bear Creek</u>
- North Creek Sub-basin: North Creek, Silver Creek, Smokehouse Creek
- Swamp Creek Sub-basin: Swamp Creek, Scriber Creek (WDFW SalmonScape).

The Lake Washington Sub-basins/Creeks included in the Lake Washington Service Area are:

- <u>Kelsey Creek Sub-basin: Kelsey Creek, Richards Creek (not including areas south of I-90)</u>
- <u>Lake Washington Sub-basin: Goff Creek, Yarrow Creek, Valley Creek, Forbes Creek, Juanita Creek, Lyon Creek, and McAleer Creek (WDFW SalmonScape)</u>

<u>Lake Washington Sub-basins/Creeks excluded from the Lake Washington Service Area are:</u>
portions of the Kelsey Creek Sub-basin located south of I-90 (including Richards Creek Sub-basin,
Sunset Creek Sub-basin, East Creek Sub-basin, etc.), May Creek, Coal Creek, Thornton Creek,
Ravenna Creek, and the Cedar River Watershed.

Use of Credits outside the Service Area - The Bank may be used on a case by case basis to compensate for permitted impacts falling geographically outside of the Service Areas, and/or beyond the allowable impact types specified, if approved by the agencies requiring mitigation and the Mitigation Bank Interagency Review Team. Typically, out-of-service-area impacts are only approved when purchasing mitigation bank credits would be practicable and environmentally preferable to other mitigation alternatives. Examples are projects that span multiple watershed basins such as transportation and utility corridors and pipelines, and settlement of enforcement actions.

Below is general information that can be used to justify and/or describe the rationale for use of the Keller Farm Mitigation Bank within a Bank use Plan:

The ______ roject Name_____ is located within the Mitigation Bank Service Area of the "Keller Farm Mitigation Bank" (KFMB), a 75-acre State and Federally certified mitigation bank project in Water Resource Inventory Area (WRIA) 8. The KFMB is located at the confluence of two regionally significant salmon bearing streams (Bear and Evans Creeks) in the City of Redmond.

The KFMB has undergone an extensive permitting and review process which involved input and direction from multiple agencies and reviewing groups. Based on work accomplished, credits have been approved and released for sale by the Interagency Review Team (IRT) co-chaired by the U.S. Army Corps of Engineers and the Washington State Department of Ecology. The KFMB restoration design, performance standards and monitoring plan is detailed in the bank's Mitigation Banking Instrument (MBI). This plan was prepared in consultation with the IRT and follows specific requirements of Chapter 173-700 WAC for Wetland Mitigation Banks. The following agencies and stakeholders participated in the development of the banking instrument:

- US Army Corps of Engineers, Seattle District
- US Environmental Protection Agency
- Washington State Department of Ecology
- National Marine Fisheries Service
- Washington Department of Fish and Wildlife
- Muckleshoot Indian Tribe Fisheries Division
- King County-WRIA 8 Technical Committee
- City of Redmond

The availability of mitigation credits from a large-scale mitigation bank project in WRIA-8 provides many benefits above and beyond traditional permittee-responsible mitigation. First the bank project was reviewed extensively by multiple agencies to ensure appropriate siting within the watershed, appropriate design and restoration approach as well as appropriate metrics for evaluating success. In the Lake Washington-Sammamish Watershed, there are relatively little restoration or mitigation opportunities available that provide meaningful functional lift of existing aquatic resources. There are limited mitigation opportunities when looking "on-site" versus locating mitigation in a more sustainable and effective part of the watershed.

Mitigation Bank Projects are highly regulated with multiple agencies overseeing their development and monitoring. Banks are situated in the landscape using criteria found in the joint guidance from the USACE and Washington Department of Ecology "Selecting Mitigation Sites Using a Watershed Approach" to targeting restoration actions in a WRIA or watershed. Banks are often very large, highly functioning restoration projects that restore a variety of wetland, riparian and associated upland habitat types, creating more complete and interconnected systems connected to habitat

corridors rather than habitat patches separated and fragmented by development. Banks are fully protected by a conservation easement which is funded in perpetuity through the establishment of an endowment fund and credits are only released when the bank has shown that it is meeting it's stated performance standards.

The USACE's 2008 Final Rule "Compensatory Mitigation for Losses of Aquatic Resources" establishes a preference for the use of certified mitigation banks to compensate for permitted impacts to aquatic resources:

"Since a mitigation bank must have an approved mitigation plan and other assurances in place before any of its credits can be used to offset permitted impacts, this rule establishes a preference for the use of mitigation bank credits, which reduces some of the risks and uncertainties associated with compensatory mitigation."

The USACE rule goes on to read:

"when the permitted impacts are located within the service area of an approved mitigation bank, and the bank has the appropriate number and resource type of credits available, the permittee's compensatory mitigation requirements may be met by securing those credits from the sponsor" (33 CFR part 332.3b[2]).

Washington State's Mitigation Banking Rule provides the following support for the use and establishment of Mitigation Banks in Washington State:

"WAC 173-700-100 Background and purpose.

- (1) The Wetlands Mitigation Banking Act, chapter 90.84 RCW, identifies wetland mitigation banking (banks) as an important regulatory tool for providing compensatory mitigation for unavoidable impacts to wetlands and declares it the policy of the state to support banking. The act directs the department of ecology (department) to adopt rules establishing a statewide process for certifying banks.
- (2) The department anticipates that banks will provide compensatory mitigation in advance of unavoidable impacts to wetlands and will consolidate compensatory mitigation into larger contiguous areas for regionally significant ecological benefits.
 - (3) Banks prioritize restoration of wetland functions and as such should be complementary to the restoration of ecosystems and ecosystem processes as identified in state or locally adopted science-based watershed management plans.
 - (4) The purpose of this chapter is to encourage banking by providing an efficient, predictable statewide framework for the certification and operation of environmentally sound banks."

Local governments also implement land use regulations, which control the type and intensity of development within a given jurisdiction. Through guidance from Ecology, local governments have adopted critical are regulations supporting the use of mitigation banks and recognizing their unique ability to address watershed scale restoration objectives and limiting factors for

aquatic and critical areas. This is especially the case in more urban watersheds where very little meaningful mitigation actions may exist on-site or in the immediate sub-basin of a development project.

The Keller Farm Bank Site has been identified as a high priority stream and wetland restoration project in Water Resource Inventory Area (WRIA) 8 for the last thirty years, beginning with the Bear Creek Basin Plan in the 1980's. The bank site is identified as a 'Near Term Action' important to regional salmonid habitat restoration efforts as part of the Lake Washington/Cedar/Sammamish Salmon Conservation Plan for WRIA 8 adopted by NOAA Fisheries and implemented by local stakeholders to achieve Chinook salmon recovery consistent with the Endangered Species Act (Chinook Salmon Conservation Plan (CSCP), 2005; ESA 16 U.S.C. S 1531).

The KFMB is located at the confluence of two regionally significant, salmon-bearing streams, Bear Creek and Evans Creek. Another smaller stream, Perrigo Creek, flows adjacent to a portion of the western Bank boundary and will be rerouted and daylighted onto the bank site. The Bank design goals were developed as part of the Project Prospectus (Habitat Bank, 2015) and Basis of Design Report (Shannon and Wilson. Inc., 2018). The design goals are consistent with Ecology, Corps, and U.S. Environmental Protection agency guidelines for establishing mitigation bank goals and criteria, as well as with Bear Creek Basin restoration planning efforts and WRIA-8 restoration goals as established by the WRIA-8 Salmon Recovery Council. Wetland and habitat restoration goals on the Bank site were developed to address the limiting factors in the watershed related to the loss of wetland hydrology, the loss of wetland habitat and vegetation communities, and the alteration of topography affecting wetlands, floodplain, and stream habitat conditions. Implementation of the Keller Farm Mitigation Bank will result in substantial gains in aquatic ecosystem functions as compared to baseline conditions present on the site.

The site-specific goals and objectives for the KFMB include:

- Permanently protect ecosystem functions at the Bank by implementing the Bank Instrument and executing a conservation easement with permanent funding for site stewardship.
- Re-establish wetland hydrology and varying wetland hydroperiods across the site by disabling farm ditches, reconnecting Bear creek with its floodplain, and performing grading actions to re-establish wetland hydrology and riparian habitat across the Bank site.
- Create additional wetland habitat areas that support wetland-dependent organisms and anadromous fish species. Increase habitat structure and diversity on the Bank site over existing degraded conditions.

- Re-establish wetland vegetation and native plant communities across the site. Remove
 and control noxious and invasive plant species and reintroduce native vegetation to
 increase habitat complexity in the floodplain wetlands and adjacent upland areas. Plant
 native trees, shrubs, and herbaceous species to re-establish a mosaic of habitat
 communities within the Bank property.
- Improve access for aquatic organisms to floodplain wetland and aquatic areas. Enhance and create off-channel rearing and refuge habitat for salmonids within the floodplain streams and deeper backwater areas connected to Bear Creek.
- Reconnect Bear Creek to the floodplain and improve floodplain functions on the Bank site including attenuation of flood flows, reductions in peak flood flows, food web and organic material support and transport, and refuge habitat for fish and wildlife during flood events.
- Establish a connection point for the future relocation of Perrigo Creek through the adjacent parcel north of the Bank.
- Reestablish and rehabilitate stream channel habitat in the floodplain through grading and addition of large woody debris (LWD). Create pool habitat and increase channel habitat complexity.
- Increase shading and cover of streams through planting on the Bank site over existing conditions.

Specific creditable restoration actions at KFMB are shown below in Table 1:

Table 1. Creditable Restoration Actions at KFMB.

HABITAT TYPE (Action)	CREDITABLE ACRES	NON- CREDITABLE BUFFERS	NON- CREDITABLE EASEMENTS	TOTALS
Riparian Upland Forest (Enhancement)	6.7	5.1	0.1	11.9
Riparian Forest Wetland (Re-establishment)	17.5	1.5	0.1	19.1
Shrub-Scrub/Emergent Wetland Mix (Re- establishment)	28.7	2.8	0.5	32.0
Riparian Wetland Stream Complex (Rehabilitation)	3.9	0.3	0.1	4.3
Existing Wetland PFO/PSS Mix (Rehabilitation)	7.7	0.1	0.1	7.9
Subtotal	64.5	9.8	0.9	
Total		75.	2	

In order to mitigate for the proposed discharge of fill material into _____, the applicant is proposing off-site mitigation from the KFMB. The KFMB has met all required performance standards applicable to the release of available credits under the terms of the Mitigation Bank Instrument (MBI). Given the size, scope and diversity of this bank located in an urban setting and its unique ability to restore both wetland area and functions as well as critical habitat for salmonids, the KFMB is the most suitable location for the proposed project's compensatory mitigation requirements.

For more information about the bank contact:

Habitat Bank LLC. Zach Woodward Project Manager P.O. Box 354

Kirkland, WA 98033 Phone: (425) 205-0279

Email: Zachary.woodward@habitatbank.com

See also: www.habitatbank.com

Confirmation of Mitigation Credit Availability

As of _DATE_____, the Keller Farm Mitigation Bank has approximately ____ mitigation credits available for immediate use. Mitigation credits are provided from the bank to an applicant's project using the suggested ratios in the table below, as approved by the U.S. Army Corps of Engineers (USACE) and the Washington State Department of Ecology (DOE).

Permanent Resource Impact	Credit to Impact Ratio
Wetland, Category I	Case by case
Wetland, Category II	1.2 to 1
Wetland, Category III	1.0 to 1
Wetland, Category IV	0.85 to 1
Critical Area Buffer	0.3 to 1
Stream	Case by case

Proof of the current number of available mitigation credits at the KFMB site can be confirmed by the approving agency(s) through the Interagency Review Team (IRT).

Contact:

Kate Thompson
Shorelands and Environmental Assistance Program
P.O. Box 47600
Olympia, WA 98504
(360) 407-6749
kate.thompson@ecy.wa.gov

Suzanne L. Anderson, PhD, PWS
Project Manager/Banking Lead
Seattle District U.S. Army Corps of Engineers
Regulatory Branch, CENWS-OD-RG

Mail Address: P.O. Box 3755 Seattle, WA 98124-3755

Building Location: 4735 East Marginal Way South

Seattle, WA 98134

Email: Suzanne.l.Anderson@usace.army.mil

Wetland/Stream Functions Provided at KFMB

This section should describe the functions expected to be provided at the Keller Farm Mitigation Bank. This information is available in the Mitigation Banking Instrument (MBI) or in other documents that have consolidated this information from the MBI (Ask a KFMB representative if you need more information). Describe how the functions and wetland types (e.g., freshwater/estuarine, HGM type, landscape setting) of the bank relate to the functions and types of wetlands that are expected to be affected by the project. This section should demonstrate how credits from the bank will provide adequate mitigation for project impacts, so be sure to provide appropriate detail. For ease of comparison, please discuss the bank's functions in the same way as the impact wetland's functions – grouped as water quality, hydrologic, and habitat functions.

Pages A1-A2, A13-A-22 of the MBI and B24-27 discuss the ecological goals existing and expected post-project functions to be provided by the KFMB. A suggested summary to include this section is:

The following is excerpted or paraphrased from the Keller Farm Mitigation Bank MBI:

The Keller Farm Mitigation Bank is located at the floodplain confluence of two regionally significant salmon bearing streams, Bear and Evans Creeks. The Bear Creek watershed is designated as a "Highest Restoration Watershed" by the City of Redmond. KFMB is a high priority wetland and stream restoration site important to regional salmonid habitat restoration efforts.

Historically, the bank site was a wetland and upland "mosaic" complex with forested, shrub, and herbaceous wetlands, beaver ponds, and tributary streams that flowed into Bear Creek. Two federally threatened salmonid species, Puget Sound Chinook and Steelhead, utilize Bear and Evans Creeks and their larger tributaries, as well as coho, sockeye, and coastal cutthroat, and numerous other non-salmonid fish species. The bank site is known to have been regularly used by Native Americans for fishing, camping and trading. The site was homesteaded in the 1880s and converted to agricultural use. It was extensively ditched, drained, grazed, tilled, and managed as a dairy farm through the 1980s. Very little remnant wetland area remained compared to historic conditions, and a network of linear ditches replaced the natural floodplain tributary streams to convey water off the site.

The KFMB includes wetland habitat areas that are classified as "depressional and riverine" under the HGM classification system and "palustrine and riverine" wetlands under the Cowardin classification system. Improvements to water quality, water quantity, and habitat functions within the re-established and rehabilitated wetland areas on the KFMB site will be documented and evaluated through the Bank's performance standards and monitoring reports, which allow credits to be generated and released for use by applicants. The improvement of existing and historic wetlands on the Bank site can be placed into two categories of restoration actions, per the joint agency guidance on compensatory mitigation found in *Wetland Mitigation in Washington State Part.1 Version 1* (Washington Department of Ecology, et al., 2006):

Wetland Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres and functions. Activities could include removing fill, plugging ditches, or breaking drain tiles.

Wetland re-establishment actions at the Keller Farm Mitigation Bank include restoring wetland hydrology to historical wetland areas within the Bear Creek Floodplain that have been drained over the last 100 years by farm ditches.

Re-establishment activities for wetland hydrology include reconnecting historical wetlands and existing wetlands to floodplain streams by 1). disabling a series of deep drainage ditches and drainage tiles, 2). creating additional connection points between the floodplain wetlands and Bear Creek to increase the normal frequency of overbank flows 3). reconnecting and daylighting "Perrigo Creek" into the Bank Site to increase hydrologic inputs to the site, and 4.) providing habitat and space to account for beavers utilizing their historical habitat areas and creating additional floodplain inundation and saturation of soils.

These actions will reconnect wetland areas to their historical sources of hydrology and create highly functional wetland and riparian habitat types for juvenile salmonids, amphibians and other aquatic dependent organisms. Disabling ditches and reconnecting the high groundwater table to wetland areas on the bank site will re-saturate and inundate historical wetland areas and provide additional flood storage and attenuation of baseflows in Bear Creek. Shading these areas by creating shrub and forested wetland habitat communities will also reduce peak temperatures in aquatic areas and work to maintain the cool water input to Bear Creek from the bank site which is essential during the summer for Bear Creek and the Sammamish Basin for migrating anadromous fish.

Wetland Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions [and processes] of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or returning tidal influence to a wetland.

Wetland rehabilitation actions include restoring the natural wetland hydroperiod of existing wetlands through floodplain reconnection with Bear Creek and disabling of existing ditches, grading to create connectivity between existing wetlands and reestablished wetlands, and reestablishing native vegetation communities within the existing wetland areas.

Additionally, riparian uplands surrounding the re-established and rehabilitated wetland areas and streams will be enhanced through the planting of native trees and shrubs which will create interspersed terrestrial habitat, important for aquatic dependent wildlife as well as providing other improvements such as shading aquatic areas on the site and providing a source of organic material and large wood.

Restoration actions across the bank site will rehabilitate 7.9 acres of existing wetland habitat while re-establishing approximately 51.1 acres of forested, shrub and emergent wetlands. The existing 7,114 linear feet (1.7 acres) of ditched tributary streams will be rehabilitated and approximately 5,162 linear feet (2.6 acres) of stream channel will be added across the Bank site.

Water Quality Functions

All pre-existing wetlands provided a medium level of water quality functions (total water quality score of 6-7 points) and a low or medium site potential function for water quality improvement using the Washington State Wetland Rating System for Western Washington (Rating System). All wetlands are located within the floodplain of Bear Creek and are inundated during overbank flood events. However, lack of surface channel connections with Bear Creek or existing onsite ditches and limited extent of seasonal ponding during non-flood events restrict the site potential of existing wetlands to provide water quality functions. In addition, because the site was in agricultural use, pollutant filtering capability of vegetation in site wetlands was limited. All existing wetlands rate high for providing water quality improvement that is valuable to society because both Bear Creek adjacent to the Bank and the tributary Perrigo Creek that flows through the Bank site are listed on the State of Washington 303d list as impaired for water quality parameters. Perrigo Creek is impaired for temperature and a Total Maximum Daily Load (TMDL) has been established. Bear Creek is listed for bioassessment, dissolved oxygen, temperature, and bacteria and TMDLs have been established for the latter three parameters. Existing wetlands on the Bank site would gain significant functional lift in water quality from rehabilitation and enhancement actions associated with implementation of the Bank. In addition, a net increase of 51.1 acres of wetland and 2.6 acres of stream channel/wetland complex will result. Post-construction wetland and floodplain functions related to water quality, such as removing sediments, nutrients, metals, and toxic organics will significantly increase as native vegetation establishes.

The Bank's riparian restoration and stream plantings are an integral part of a regional effort to restore riparian conditions and functions and reduce temperatures in Bear Creek and the Sammamish River. Vegetating the banks of Bear Creek and the tributary floodplain streams within the Bank site with trees and shrubs will provide additional shading during the critical months in the summer and fall when adult salmon are migrating and spawning in the Bear Creek and Sammamish River systems. The Bank was designed so that during the summer and fall periods when water levels across the Bank site will be at their lowest levels, water will be confined to the riparian stream channel areas, rather than spreading out or ponding across the site which could warm surface waters. Riparian wetlands are not expected to have extended periods of standing water June through October. Additionally, floodplain streams will maintain their groundwater connection, providing a cold-water source in the streams and to Bear Creek.

Hydrologic Functions

All pre-existing wetlands on the Bank site provided a medium level of hydrologic functions (total hydrologic score of 7 points) using the Rating System.

Restoration actions at KFMB will result in improvement to site-specific wetland and floodplain hydrologic functions and watershed-scale hydrologic processes, including increased available flood storage volume, attenuation of flood flows, reductions in peak flood flows, and groundwater recharge.

Habitat Functions

All pre-existing wetlands on the Bank site provided a medium level of habitat functions (total habitat score of 6 points) using the Rating System. Plant communities were entirely emergent and dominated by non-native and invasive species, farmed, and lacked habitat complexity.

Overall habitat suitability for wetland-associated birds, mammals, amphibians, fish and invertebrates will improve over existing conditions because of: the net increase in acreage of wetland and aquatic area, improved access for aquatic organisms to floodplain wetland and aquatic areas, the increased variety of hydroperiods, the increase in vegetation species richness and habitat interspersion, the addition of habitat enhancement features such as large woody debris, and accessibility to contiguous habitat areas such as the adjacent WSDOT mitigation site and NPGA areas along Bear Creek.

The restoration of 7,114 linear feet of ditched tributary streams and addition of 5,162 linear feet of stream channel will increase available suitable habitat for salmonids and other fish species, including ESA-listed species, including additional off-channel rearing and refuge habitat within the floodplain streams and deeper backwater areas connected to Bear Creek.

Summary of Functional Improvements

Existing wetlands on the Bank site gain significant functional lift in water quality and habitat functions from rehabilitation and enhancement actions associated with implementation of the Bank. Hydrologic functions in existing wetlands would remain similar to pre-project conditions. Existing wetlands (7.9 ac) and re-established wetlands (63.3 ac) are anticipated to rate as Category II wetlands at maturity. For existing wetlands onsite, the Credit-Debit Method (*Calculating Credits and Debits for Compensatory Mitigation in Western Washington,* Hruby 2012) estimated that 14.2 acre-points would be generated for water quality functions and 7.9 acre-points would be generated for habitat functions with Bank implementation. Additionally, 500 water quality acre-points, 438 hydrology acre-points, and 438 habitat acre-points would be generated by re-establishing and rehabilitating approximately 63.3 acres of former wetlands on the site.

Post construction, the Bank site will consist of a mosaic of forested upland, forested, scrub/shrub, and emergent wetland, and stream channel habitat. The Bank will create new aquatic habitat for resident and anadromous fish species and improve existing habitat for the regionally important

salmonid populations that are present on the Bank site. A net increase of 51.1 acres of wetland and 2.6 acres of stream channel/wetland will result from Bank implementation.

Post-project conditions will provide numerous functional benefits over existing conditions including: allowing Bear Creek flows to infiltrate in wetland areas during a wider range of flow conditions; recharging the local groundwater aquifer; increasing floodplain wetland groundwater storage; providing cooling of groundwater through soil heat adsorption of surface waters; and delaying release of cooler groundwater to the floodplain streams later in the spring and summer when stream temperatures are highest. Plantings adjacent to Bear Creek and floodplain streams will also help moderate summer water temperatures, and re-established vegetation communities within the wetlands and riparian upland areas will increase habitat diversity and accessibility for aquatic dependent plants and animals. Enhanced floodplain connections with Bear Creek will be established that will increase the range of flow conditions where Bear Creek flows will contribute to hydrologic support of floodplain wetlands and streams. These connections will also allow fish access to the re-established wetlands and stream channels in the floodplain.

Wetland/Stream/Buffer Functions Not Mitigated at Mitigation Bank

Describe any functions that will be affected by the project that are not expected to be compensated for by the mitigation bank. This may include functions that are not provided by the bank or functions that a regulatory agency has determined must be replaced within or near the project area. Examples include stormwater treatment, groundwater recharge, flood storage, riparian habitat and others. If there are functions that will not be addressed by the mitigation bank, then explain how these functions will be otherwise mitigated by the project – cite other documents that describe this mitigation. This may include restoration of temporarily impacted areas as well. Alternatively, it is possible that a specific bank will not compensate for every function of the affected wetland but that there will be a net gain in other functions that justifies that loss. If so, explain the reasoning that lead to that conclusion.

This will be a project-specific discussion. See the following example Bank Use Plans for how this section was presented:

http://www.ci.lacenter.wa.us/city_departments/pdfs/2016_Highland_MitigationBankUsePlan.pdf

https://static.spokanecity.org/documents/projects/sia-wetland-removal/sia-wetland-removal-revised-wetland-mitigation-bank-use-plan.pdf

 $\frac{https://mountvernonwa.gov/DocumentCenter/View/10312/CheemaDivisionStWetlandMitgn-FINAL-1?bidId=\\$

Proposed Mitigation Credits

Show the mitigation ratios that were used to calculate the total number of bank credits needed to compensate for the project impacts. Include a summary table of project impacts and the number of credits required for each type of impact to aquatic or critical areas.

The KFMB credit to impact ratios are:

Permanent Resource Impact	Credit to Impact Ratio
Wetland, Category I	Case by case
Wetland, Category II	1.2 to 1
Wetland, Category III	1.0 to 1
Wetland, Category IV	0.85 to 1
Critical Area Buffer	0.3 to 1
Stream	Case by case

Credit Purchase or Transfer Timing

This section should note the anticipated timing of purchase or transfer of the credits and any other details regarding credit use that may be relevant to the permit process.

Suggested text is:

Project Applicant name will enter into a Purchase Agreement with Keller Farm Mitigation Bank (Habitat Bank, LLC) to purchase **xx** credits that would appropriately mitigate for the proposed project impacts. The anticipated timing of credit purchase and transfer is **date**, following permit issuance by the agencies with jurisdiction. Purchase of credits will be completed prior to the onset of any activities affecting impacted resources. Nothing in the Purchase Agreement shall be interpreted as permitting or construed to permit any activity that otherwise requires a federal, state and/or local permit. Proof of the credit purchase and transfer will be provided in the form a notification letter to the approving agencies and to the IRT co-chairs by the Bank Sponsor. Upon service of this notification, the mitigation requirement to purchase **xx** mitigation credits will be fully satisfied.

Refer to this document for more guidance on preparing a Bank Use Plan - Interagency Review Team for Washington State. 2009. Using Credits from Wetland Mitigation Banks: Guidance to Applicants on the Submittal Contents for Bank Use Plans. Revised February 19. Available at: https://fortress.wa.gov/ecy/ezshare/sea/MitigationBanking/Templates/BankUsePlan.pdf

Citations

- Compensatory Mitigation for Losses of Aquatic Resources. 2008. 33 C.F.R. §332.
- Habitat Bank, LLC. 2019. Keller Farm Mitigation Bank Mitigation Banking Instrument. Available at: https://ecology.wa.gov/Water-Shorelines/Wetlands/Mitigation/Wetland-mitigation-banking/Mitigation-bank-projects/Keller-Farm
- Interagency Review Team for Washington State. 2009. Using Credits from Wetland Mitigation Banks: Guidance to Applicants on the Submittal Contents for Bank Use Plans. Revised February 19. Available at:
 - https://fortress.wa.gov/ecy/ezshare/sea/MitigationBanking/Templates/BankUsePlan.pdf
- Hruby, T. 2012. Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington, Final Report, March 2012. Washington State Department of Ecology publication #10-06-11. Available at: https://ecology.wa.gov/Water-Shorelines/Wetlands/Tools-resources/Credit-debit-method
- Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update Effective January 2015. Publication No. 14-06-029. Available at: https://ecologv.wa.gov/Water-Shorelines/Wetlands/Tools-resources/Rating-systems
- Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. March 2006. Wetland Mitigation in Washington State Part 1: Agency Policies and Guidance (Version 1). Washington State Department of Ecology Publication #06-06-011a. Olympia, WA. Available at: https://ecology.wa.gov/Water-Shorelines/Wetlands/Mitigation/Interagency-guidance
- Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. March 2006. Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans (Version 1). Washington State Department of Ecology Publication #06-06-011b. Olympia, WA. Available at: https://ecology.wa.gov/Water-Shorelines/Wetlands/Mitigation/Interagency-guidance

APPENDIX E

Critical Areas Conceptual Mitigation Plans

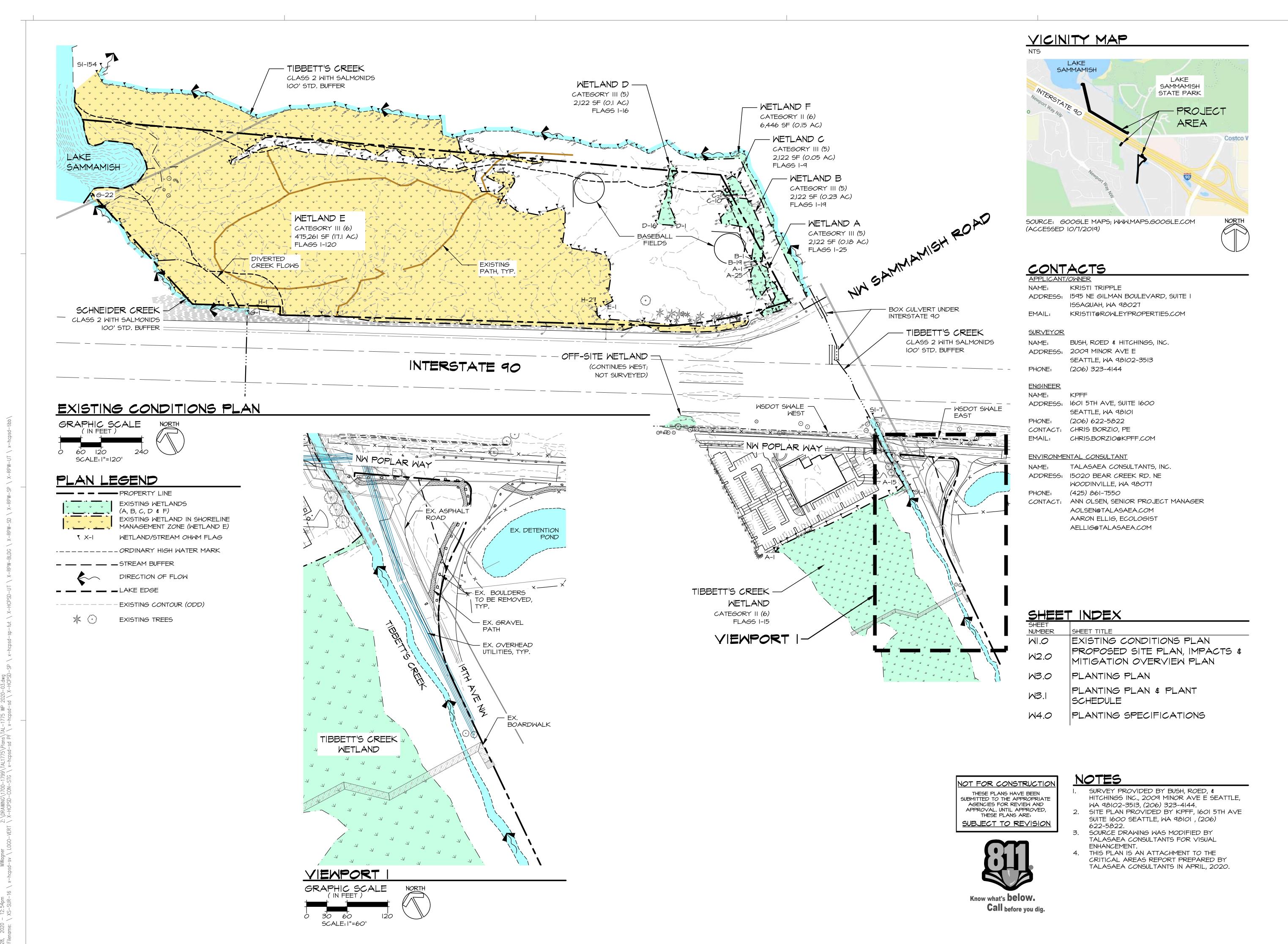
Sheet W1.0: Existing Conditions Plan

Sheet W2.0: Proposed Site Plan, Impacts, & Mitigation Overview Plan

Sheet W3.0: Planting Typical Plan – Zones 1 and 2

Sheet W3.1: Planting Typical Plan – Zone 3 and Plant Schedule

Sheet W4.0: Planting Specifications



Isoff

1601 5th Avenue, Suite 1600

1601 5th Avenue, Suite 1600 Seattle, WA 98101 206.622.5822 www.kpff.com



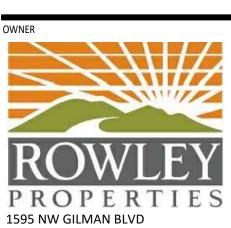
PROJECT
HYLA CROSSING
PUMPED STORMWATER

Resource and Environmental Planning

Woodinville, Washington 98077

ISSAQUAH, WA

DISCHARGE



PROFESSIONAL SEAL

ISSAQUAH WA, 98027

DESIGN TEAM

EP, AO, MW

PRINCIPAL

PROJECT MANAGER

AO

PROJECT LANDSCAPE ARCHITECT

DRAWN BY MW
CHECKED BY AO

DRAWING SET DESCRIPTION

ASDP

REVISIONS

No. DATE DESCRIPTION

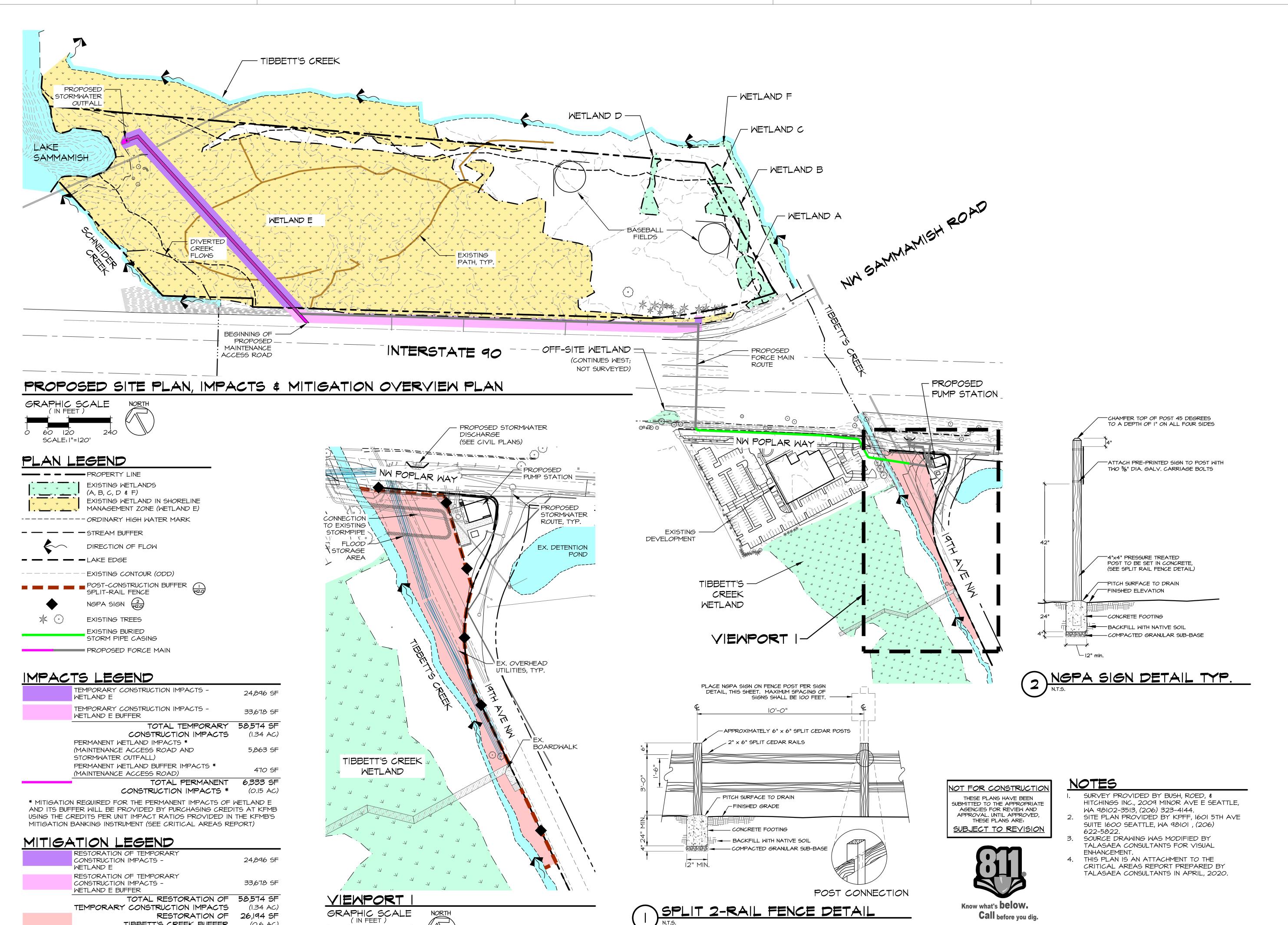
1 10/03/2019
2 4/1/2020 COI ASDP

EXISTING CONDITIONS PLAN

SHEET NUMBER

W1.0

SSUE DATE 4/1/2020



TIBBETT'S CREEK BUFFER

(PER THE DEVELOPER'S AGREEMENT)

(0.6 AC)

30 60

SCALE: 1"=60'

Seattle, WA 98101 206.622.5822 www.kpff.com



CONSULTANTS, INC. Environmental Planning Woodinville, Washington 98077

HYLA CROSSING PUMPED STORMWATER DISCHARGE

ISSAQUAH, WA

1595 NW GILMAN BLVD

PROFESSIONAL SEAL

ISSAQUAH WA, 98027

EP, AO, MW PRINCIPAL PROJECT MANAGER

CHECKED BY AO DRAWING SET DESCRIPTION

DRAWN BY

PROJECT LANDSCAPE ARCHITECT

ASDP

REVISIONS No. DATE **DESCRIPTION** 10/03/2019 **30% CD** 4/1/2020 **COI ASDP**

SITE PLAN, **IMPACTS & MITIGATION OVERVIEW PLAN**

W2.0

ISSUE DATE 4/1/2020

PLANTING

DENSITY TABLES

ZONE I: PLANTING DENSITY TABLE - WETLAND E

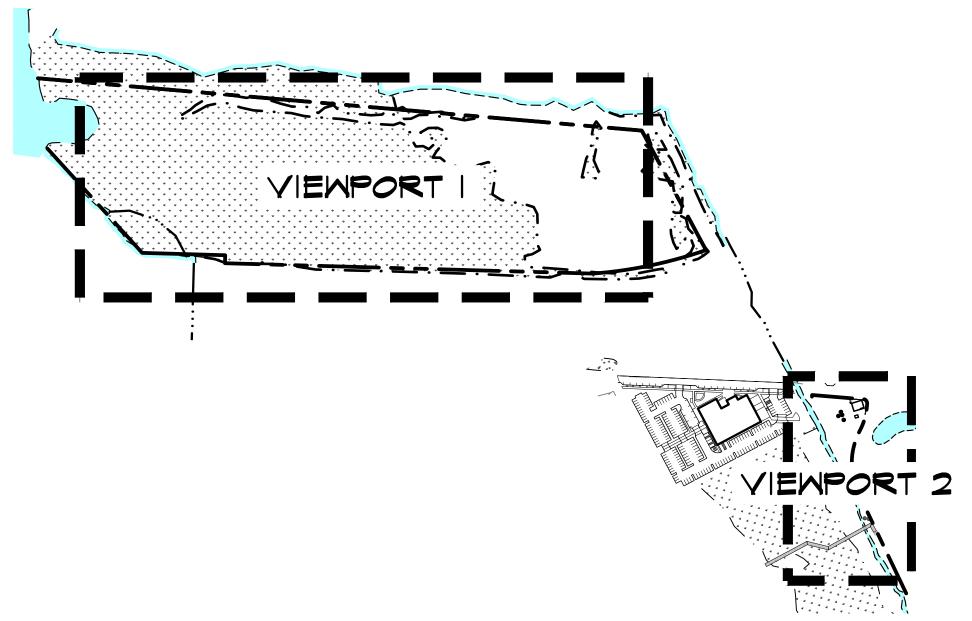
	REQUIRED	DESIGNED
WETLAND AREA	30,36	61 SF
MAINTENANCE ACCESS ROAD	5,565 SF	
PLANTED AREA	24,796 SF	
TREES 9' O.C.*	0	0
SHRUBS 6' O.C.	694	991
GROUNDCOVER 4' O.C.	6,199	6,199

^{*} PER CITY OF ISSAQUAH, NO TREES WILL BE PLANTED WITHIN STORMWATER EASEMENTS.

ZONE 2: PLANTING DENSITY TABLE - WETLAND E BUFFER

	REQUIRED	DESIGNED
PLANTED AREA	34,14	9 SF
TREES 9' O.C.*	0	0
SHRUBS 6' O.C. (FULL COVERAGE)	956	956
GROUNDCOVER 4' O.C. (50% COVERAGE)	8,537	8,537

* PER CITY OF ISSAQUAH, NO TREES WILL BE PLANTED WITHIN STORMWATER EASEMENTS.



PLANTING PLAN KEY





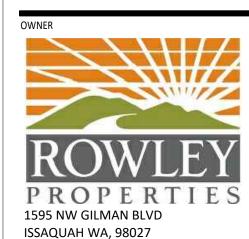


HYLA CROSSING PUMPED STORMWATER

Woodinville, Washington 98077

ISSAQUAH, WA

DISCHARGE



PROFESSIONAL SEAL

EP, AO, MW PRINCIPAL

PROJECT MANAGER PROJECT LANDSCAPE ARCHITECT

CHECKED BY AO DRAWING SET DESCRIPTION

MW

ASDP

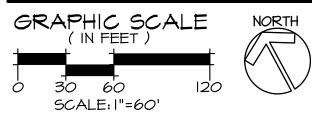
DRAWN BY

REVISIONS					
No. 1 2	DATE 10/03/2019 4/1/2020	DESCRIPTION 30% CD COI ASDP			

PLANTING PLAN

ISSUE DATE 4/1/2020

PLANT COMMUNITIES PLAN - VIEWPORT



CREEK

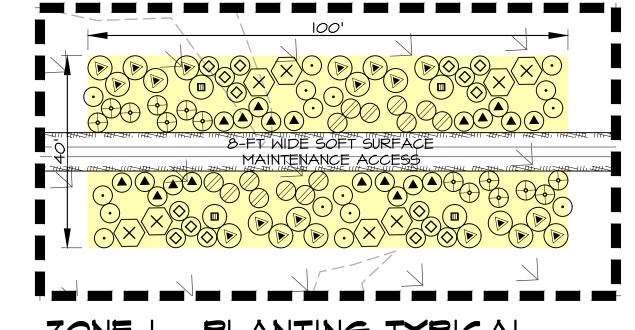
PLAN LEGEND

EXISTING WETLANDS (A, B, C, D & F) ----ORDINARY HIGH WATER MARK - - - STREAM BUFFER DIRECTION OF FLOW — — — LAKE EDGE

----EXISTING CONTOUR (ODD)

PLANT COMMUNITIES LEGEND

24,896 SF ZONE I (WETLAND E RESTORATION; (0.57 AC) SCRUB-SHRUB WETLAND) 33,678 SF ZONE 2 (WETLAND E BUFFER RESTORATION; (0.77 AC) SCRUB-SHRUB AND UPLAND MEADOW) 26,194 SF ZONE 3 (TIBBETT'S CREEK BUFFER RESTORATION; (0.60 AC)



ZONE | - PLANTING TYPICAL

PLANT LIST

SMALL TREES/LARGE SHRUBS SYMBOL SCIENTIFIC NAME COMMON NAME CRATAEGUS DOUGLASII BLACK HAWTHORN SALIX SCOULERIANA SCOULER WILLOW $\langle \mathsf{X} \rangle$ SALIX SITCHENSIS SITKA WILLOW SAMBUCUS RACEMOSA RED ELDERBERRY

SCRUB-SHRUB)

MASSING SHRUBS SYMBOL SCIENTIFIC NAME

COMMON NAME CORNUS ALBA (SERICEA) RED-OSIER DOGWOOD LONICERA INVOLUCRATA BLACK TWIN-BERRY ROSA PISOCARPA CLUSTERED WILD ROSE RUBUS SPECTABILIS SALMONBERRY SPIREA DOUGLASII WESTERN SPIREA

(NATIVE WETLAND GRASS SEED MIX)**

SYMBOL SCIENTIFIC NAME COMMON NAME GLYCERIA OCCIDENTALIS WESTERN MANNAGRASS AMERICAN SLOUGHGRASS BECKMANNIA SYZIGACHNE HORDEUM BRACHYANTHERUM MEADOW BARLEY ALOPECURUS AEQUALIS SHORTAWN FOXTAIL

(NATIVE UPLAND GRASS SEED MIX)**

SYMBOL SCIENTIFIC NAME COMMON NAME ELYMUS GLAUCUS BLUE WILDRYE BROMUS CARINATUS CALIFORNIA BROME HORDEUM BRACHYANTHERUM MEADOW BARLEY ROEMER'S FESCUE FESTUCA ROMERI SLENDER HAIRGRASS DESCHAMPSIA ELONGATA SPIKE BENTGRASS AGROSTIS EXARATA TUFTED HAIRGRASS DESCHAMPSIA CESPITOSA FESTUCA RUBRA RUBRA RED FESCUE

> ** NATIVE GRASS SEED MIXES WILL BE USED AS A FAST GROWING GROUNDCOVER IN MANY AREAS THAT WILL REDUCE THE RESURGENCE OF REED CANARYGRASS WHILE SHRUB PLANTINGS GROW UP TO SHADE OUT THIS INVASIVE SPECIES.

NOT FOR CONSTRUCTION THESE PLANS HAVE BEEN

SUBMITTED TO THE APPROPRIATE

SCALE: I"=20'

AGENCIES FOR REVIEW AND APPROVAL. UNTIL APPROVED, THESE PLANS ARE: SUBJECT TO REVISION



Call before you dig.

SURVEY PROVIDED BY BUSH, ROED, \$ HITCHINGS INC., 2009 MINOR AVE E SEATTLE, MA 98102-3513, (206) 323-4144. 2. SITE PLAN PROVIDED BY KPFF, 1601 5TH AVE SUITE 1600 SEATTLE, WA 98101, (206)

622-5822. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.

NW SAMAMMISH RD

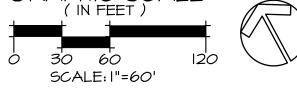
ZONE 2 - PLANTING TYPICAL

NOTE: NATIVE UPLAND GRASS SEED MIX WILL BE INSTALLED ALONG THE SHOULDER OF NW SAMAMMISH ROAD OUTSIDE THE GRAVEL SHOULDER TO REDUCE LINE OF SIGHT ISSUES AND

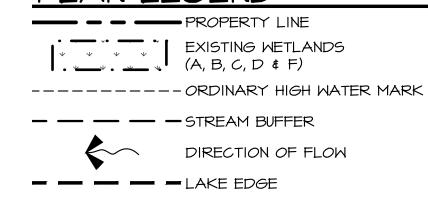
INCREASED NEED FOR MAINTENANCE BY THE CITY OF ISSAQUAH.

4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN APRIL, 2020.

W3.0



PLAN LEGEND



----EXISTING CONTOUR (ODD)

GENERAL PLANT INSTALLATION NOTES

- I. PLANT TREES AND/OR SHRUBS I" HIGHER THAN DEPTH GROWN AT NURSERY.
- 2. FOR CONTAINER TREES AND/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
- 3. STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET AND OVER IN HEIGHT WITH ONE (I) STAKE PER TREE. STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR ROOTBALL, IN LINE WITH THE PREVAILING WIND. STAKES SHALL BE LOOSELY ATTACHED USING CHAIN-LOCK TREE TIES TO ALLOW FOR SOME TRUNK MOVEMENT. STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
- 4. WATER PLANTS IMMEDIATELY UPON PLANTING, THEN PROVIDE MANUAL WATERING OR A TEMPORARY IRRIGATION SYSTEM TO PREVENT PLANT MORTALITY AND ENSURE PROPER PLANT ESTABLISHMENT. PLANTS SHALL RECEIVE A MINIMUM OF APPROXIMATELY ONE INCH OF WATER EVERY WEEK DURING THE DRY SEASON (GENERALLY JUNE 15TH OCTOBER 15TH, OR EARLIER OR LATER IF CONDITIONS WARRANT) FOR THE FIRST SEASON AFTER PLANTING. IRRIGATION AMOUNTS MAY NEED TO BE INCREASED DURING PROLONGED PERIODS OF HOT, DRY WEATHER.
- 5. IN THE BUFFER AREAS ONLY, FERTILIZE ALL TREES AND SHRUBS WITH A SLOW-RELEASE GENERAL PURPOSE
 GRANULAR FERTILIZER OR SLOW-RELEASE TABLETS AT MANUFACTURER'S SPECIFIED RATE. NO FERTILIZER SHALL
 BE APPLIED WITHIN WETLAND AREAS.
- 6. IN THE BUFFER AREAS ONLY. A SOIL MOISTURE RETENTION AGENT, SUCH AS "SOILMOIST" OR EQUAL, SHALL BE INCORPORATED INTO THE BACKFILL OF EACH PLANTING PIT, PER MANUFACTURER'S INSTRUCTIONS. NO MOISTURE RETENTION AGENT SHALL BE APPLIED WITHIN WETLAND AREAS.

6,549

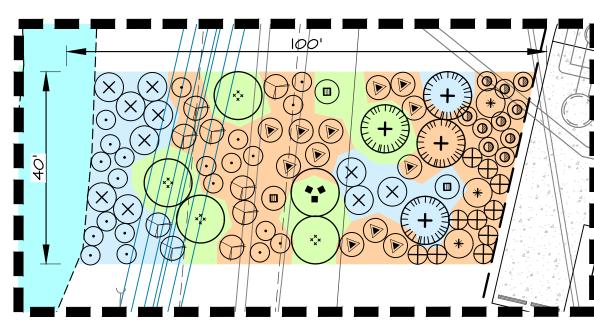
PLANTING DENSITY TABLE

GROUNDCOVER 4' O.C.

ZONE 3: PLANTING DENSITY TABLE - TIBBETT'S CREEK BUFFER

	REQUIRED	DESIGNED
PLANTED AREA	26,19	4 SF
TREES 9' O.C.*	0	30
SHRUBS 6' O.C.	733	763

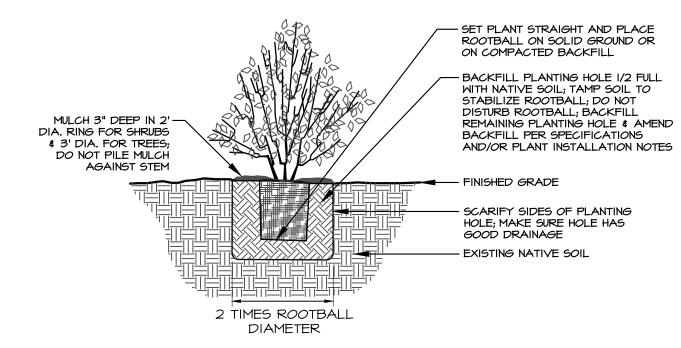
* EXTENSIVE OVERHEAD AND UNDERGROUND UTILITIES IN THIS AREA PREVENT THE USE OF LARGE TREES ON WITHIN MUCH OF THE RESTORED BUFFER. CONIFERS WILL BE PLACED IN THE FIELD IN A LIMITED FASHION.



ZONE 3 - PLANTING TYPICAL

PLANT COMMUNITIES LEGEND

<u> </u>	<u> </u>	
	ZONE (WETLAND E RESTORATION; SCRUB-SHRUB WETLAND)	24,896 SF (0.57 AC)
	ZONE 2 (WETLAND E BUFFER RESTORATION; SCRUB-SHRUB AND UPLAND MEADOW)	33,678 SF (0.77 AC)
	ZONE 3 (TIBBETT'S CREEK BUFFER RESTORATION; SCRUB-SHRUB)	26,194 SF (0.60 AC)



CONTAINER STOCK PLANTING DETAIL

PLANT SCHEDULE

LARGE TREES

			ML	QTY	1./ZO	νE			
SYMBOL	SCIENTIFIC NAME	COMMON NAME	STATUS	1	2	3	SPACING	SIZE (MIN.)	NOTES
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	-	-	30	AS SHOWN	6' HT.	FULL & BUSHY

QTY./ZONE

SMALL TREES/LARGE SHRUBS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	STATUS	1	2	3	SPACING	SIZE (MIN.)	NOTES
×××	ACER CIRCINATUM	VINE MAPLE	FAC	_	_	30	AS SHOWN	4' HT.	SINGLE TRUNK, WELL BRANCHED
*	AMELANCHIER ALNIFOLIA	SERVICEBERRY	FACU	-	-	22	5' O.C.	24" HT.	MULTI-CANE (3 MIN.)
•••	CORYLUS CORNUTA	WESTERN HAZELNUT	FACU	-	-	7	AS SHOWN	4-5' HT.	SINGLE TRUNK, WELL BRANCHED
	CRATAEGUS DOUGLASII	BLACK HAWTHORN	FAC	155	-	89	5' O.C.	24" HT.	MULTI-CANE (3 MIN.)
\bigcirc	OEMLERIA CERASIFORMIS	INDIAN PLUM	FACU	-	-	67	5' O.C.	24" HT.	MULTI-CANE (3 MIN.)
\times	SALIX SCOULERIANA	SCOULER WILLOW	FAC	-	341	222	3/SYMBOL	4' CUTTING	½" DIA. MIN., BARK INTACT
$\langle x \rangle$	SALIX SITCHENSIS	SITKA WILLOW	FACH	186	-	-	3/SYMBOL	4' CUTTING	½" DIA. MIN., BARK INTACT
	SAMBUCUS RACEMOSA	RED ELDERBERRY	FACU	31	45	22	5' O.C.	24" HT.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

			ML	QT	QTY./ZONE				
SYMBOL	SCIENTIFIC NAME	COMMON NAME	STATUS	1	2	3	SPACING	SIZE (MIN.)	NOTES
\odot	CORNUS ALBA (SERICEA)	RED-OSIER DOGWOOD	FACH	124	341	156	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)
	LONICERA INVOLUCRATA	BLACK TWIN-BERRY	FAC	155	-	-	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)
\bigoplus	ROSA NUTKANA	NOOTKA ROSE	FACU	-	-	74	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)
\bigcirc	ROSA PISOCARPA	CLUSTERED WILD ROSE	FAC	124	-	-	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)
	RUBUS PARVIFLORUS	THIMBLEBERRY	FACU	-	-	74	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)
\oslash	RUBUS SPECTABILIS	SALMONBERRY	FAC	108	-	_	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)
igoplus	SPIREA DOUGLASII	WESTERN SPIREA	FACH	108	228	-	4' O.C.	I GAL.	FULL & BUSHY

GROUNDCOVERS

			ML	QTY	1./ZO	٧E			
SYMB0L	SCIENTIFIC NAME	COMMON NAME	STATUS	1	2	3	SPACING	SIZE (MIN.)	NOTES
	GAULTHERIA SHALLON	SALAL	FACU	-	-	<i>8</i> 15	3' O.C.	I GAL.	FULL & BUSHY
	SYMPHORICARPOS ALBUS	SNOWBERRY	FACU	-	_	541	4' O.C.	I GAL.	MULTI-CANE (3 MIN.)

NATIVE WETLAND GRASS SEED MIX** (15 LBS/ACRE)

				ML	QT	Y./ZOI	NE	
SYMBOL	. SCIENTIFIC NAME	COMMON NAME	%	STATUS	- 1	2	3	UNITS
	GLYCERIA OCCIDENTALIS	WESTERN MANNAGRASS	40	<i>O</i> BL	9	-	-	LBS.
	BECKMANNIA SYZIGACHNE	AMERICAN SLOUGHGRASS	30	<i>O</i> BL				
	HORDEUM BRACHYANTHERUM	MEADOW BARLEY	20	FACH				
	ALOPECURUS AEQUALIS	SHORTAWN FOXTAIL	10	0BL				

NATIVE UPLAND GRASS SEED MIX** (15 LBS/ACRE)

					ML	QTY	1./Z <i>O</i> N	ΙE	
_	SYMBOL	SCIENTIFIC NAME	COMMON NAME	%	STATUS		2	3	UNITS
		ELYMUS GLAUCUS	BLUE WILDRYE	30	UPL	-	6	1	LBS.
		BROMUS CARINATUS	CALIFORNIA BROME	25	NL				
		HORDEUM BRACHYANTHERUM	MEADOW BARLEY	10	FACH				
		FESTUCA ROMERI	ROEMER'S FESCUE	10	NL				
		DESCHAMPSIA ELONGATA	SLENDER HAIRGRASS	10	FACH				
		AGROSTIS EXARATA	SPIKE BENTGRASS	5	FACH				
		DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	5	FACH				
		FESTUCA RUBRA RUBRA	RED FESCUE	5	NL				

** NATIVE GRASS SEED MIXES WILL BE USED AS A FAST GROWING GROUNDCOVER IN MANY AREAS THAT WILL REDUCE THE RESURGENCE OF REED CANARYGRASS WHILE SHRUB PLANTINGS GROW UP TO SHADE OUT THIS INVASIVE SPECIES.

NOT FOR CONSTRUCTION THESE PLANS HAVE BEEN SUBMITTED TO THE APPROPRIATE AGENCIES FOR REVIEW AND APPROVAL. UNTIL APPROVED,

THESE PLANS ARE:

SUBJECT TO REVISION

Know what's below. Call before you dig.

NOTES

- SURVEY PROVIDED BY BUSH, ROED, \$
 HITCHINGS INC., 2009 MINOR AVE E SEATTLE,
 WA 98102-3513, (206) 323-4144.
 SITE PLAN PROVIDED BY KPFF, 1601 5TH AVE
 SUITE 1600 SEATTLE, WA 98101, (206)
- 622-5822.

 . SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL
- ENHANCEMENT.

 4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN APRIL, 2020.

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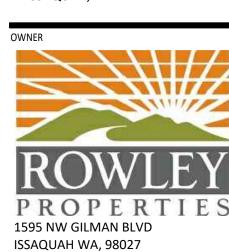
HYLA CROSSING
PUMPED STORMWATER
DISCHARGE

Environmental Planning

Woodinville, Washington 98077 Bus (425) 861-7550 - Fax (425) 861-7549

15020 Bear Creek Road Northeast

ISSAQUAH, WA



PROFESSIONAL SEAL

DESIGN TEAM

EP, AO, MW

PRINCIPAL

BS

PROJECT MANAGER

AO

PROJECT LANDSCAPE ARCHITECT

CHECKED BY AO

DRAWING SET DESCRIPTION

MW

ASDP

DRAWN BY

No. DATE DESCRIPTION 1 10/03/2019 30% CD 2 4/1/2020 COI ASDP		REVISI	SIONS						
	1	10/03/2019	30% CD						

PLANTING PLAN & PLANT SCHEDULE

SHEET NUMBER

W3.1

ISSUE DATE 4/1/2020

I.I SEQUENCING

A. <u>GENERAL CONSTRUCTION</u> I. CONTRACTOR SHALL GIVE THE PROJECT BIOLOGIST OR ECOLOGIST A MINIMUM OF TEN (IO) DAYS NOTICE PRIOR TO COMMENCING CONSTRUCTION.

- 2. NO CONSTRUCTION WORK SHALL COMMENCE UNTIL THERE IS A MEETING BETWEEN THE CLIENT, THE PROJECT BIOLOGIST OR ECOLOGIST, THE GENERAL, CLEARING, AND/OR EARTHWORK CONTRACTORS, AND THE LANDSCAPE CONTRACTOR. THE APPROVED PLANS AND SPECIFICATIONS SHALL BE REVIEWED TO ENSURE THAT ALL PARTIES INVOLVED UNDERSTAND THE INTENT AND THE SPECIFIC DETAILS RELATED TO THE CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONSTRAINTS.
- 3. LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO: (I) INDEPENDENTLY VERIFY THE ACCURACY OF UTILITY LOCATIONS, AND (2) DISCOVER AND AVOID ANY UTILITIES WITHIN THE MITIGATION AREA(S) THAT ARE NOT SHOWN, BUT WHICH MAY BE AFFECTED BY IMPLEMENTATION OF THE PLAN. SUCH AREA(S) ARE TO BE CLEARLY MARKED IN THE FIELD. THE PROJECT BIOLOGIST OR ECOLOGIST SHALL RESOLVE ANY CONFLICTS WITH THE APPROVED GRADING PLAN PRIOR TO START OF
- 4. A COPY OF THE APPROVED PLANS MUST BE ON SITE WHENEVER CONSTRUCTION IS IN PROGRESS, AND SHALL REMAIN ON SITE UNTIL PROJECT COMPLETION.
- 5. CONSTRUCTION MUST BE PERFORMED IN ACCORDANCE WITH ALL AGENCY STANDARDS, RULES, CODES, PERMIT CONDITIONS, AND/OR OTHER APPLICABLE ORDINANCES AND
- 6. THE PROJECT OWNER/APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER RELATED OR REQUIRED PERMITS PRIOR TO THE START OF CONSTRUCTION.
- 7. A QUALIFIED METLAND CONSULTANT SHALL BE ON SITE, AS NECESSARY, TO MONITOR CONSTRUCTION AND APPROVE MINOR REVISIONS TO THE PLAN.
- 8. DURING CONSTRUCTION, THE CONTRACTOR MUST USE MATERIALS AND CONSTRUCTION METHODS THAT PREVENT TOXIC SUBSTANCES AND OTHER POLLUTANTS FROM ENTERING MITIGATION AREAS OR OTHER NATURAL WATERS OF THE STATE.
- 9. PREVENTATIVE MEASURES SHALL BE USED TO PROTECT EXISTING STORM DRAINAGE
- SYSTEMS, EXISTING UTILITIES, AND ROADS. IO. PROVIDE SEDIMENT AND EROSION CONTROLS AROUND THE PROJECT AREA PRIOR TO
- SOIL DISTURBANCE FROM CONSTRUCTION ACTIVITY. B. <u>MITIGATION CONSTRUCTION</u>: THE FOLLOWING PROVIDES THE GENERAL SEQUENCE OF ACTIVITIES ANTICIPATED TO BE NECESSARY TO COMPLETE THE PLANTING PORTION OF THE MITIGATION PROJECT. SOME OF THESE ACTIVITIES MAY BE CONDUCTED CONCURRENTLY AS THE PROJECT PROGRESSES.
- I. CONDUCT A SITE MEETING BETWEEN THE CONTRACTOR, THE PROJECT BIOLOGIST OR ECOLOGIST, AND THE OWNER'S REPRESENTATIVE TO REVIEW THE PROJECT PLANS, STAGING/STOCKPILE AREAS, AND MATERIAL DISPOSAL AREAS.
- 2. PLANT TREES AND SHRUBS AS INDICATED ON MITIGATION PLANS.
- 3. PLANT STAKES (CUTTINGS).
- 4. MULCH NEWLY INSTALLED PLANTS.
- 5. INSTALL TEMPORARY IRRIGATION SYSTEM AND PROGRAM FOR 0.5 INCHES OF WATER EVERY 3 DAYS.
- 6. INSTALL FENCING AND CRITICAL AREA PROTECTION SIGNS.

1.2 SUBMITTALS

- A. PRODUCT DATA: FURNISH THE FOLLOWING WITH EACH PLANT MATERIAL DELIVERY:
- I. INVOICES INDICATING SIZES AND VARIETY OF PLANT MATERIAL 2. CERTIFICATES OF INSPECTION REQUIRED BY STATE AND FEDERAL AGENCIES.
- B. QUALITY CONTROL SUBMITTALS: I. PRIOR TO DELIVERY OF MATERIALS, CERTIFICATES OF COMPLIANCE ATTESTING THAT MATERIALS MEET THE SPECIFIED REQUIREMENTS SHALL BE FURNISHED FOR THE FOLLOWING: PLANTS, TOPSOIL, FERTILIZER, AND ORGANIC MULCH. CERTIFIED COPIES OF
 - THE MATERIAL CERTIFICATES SHALL INCLUDE THE FOLLOWING: a.PLANT MATERIALS: BOTANICAL NAME, COMMON NAME, SIZE, QUANTITY BY SPECIES, AND
 - **b.IMPORTED TOPSOIL: PARTICLE SIZE, PH, ORGANIC MATTER CONTENT, TEXTURAL CLASS,**
 - SOLUBLE SALTS, CHEMICAL AND MECHANICAL ANALYSES.
 - c.FERTILIZER: CHEMICAL ANALYSIS AND PERCENT COMPOSITION. d.IMPORTED MULCH: COMPOSITION AND SOURCE.

1.3 REFERENCES

A. <u>SIZE AND GRADING STANDARDS:</u> SHALL CONFORM TO THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.

1.4 QUALITY ASSURANCE

- A. WORKER'S QUALIFICATIONS: THE PERSONS PERFORMING THE PLANTING AND THEIR SUPERVISOR(S) SHALL BE PERSONALLY EXPERIENCED WITH PLANTING AND CARING FOR PLANT MATERIAL, AND SHALL HAVE BEEN REGULARLY EMPLOYED BY A COMPANY ENGAGED IN PLANTING AND CARING FOR PLANT MATERIAL FOR A MINIMUM OF 2 YEARS.
- B. <u>PLANT MATERIAL:</u> ALL PLANT MATERIALS SHALL BE LOCALLY GROWN OR REGIONALLY ACCLIMATIZED TO THE PACIFIC NORTHWEST.

1.5 DELIVERY, INSPECTION, STORAGE AND HANDLING

- A. <u>DELIVERY:</u> A DELIVERY SCHEDULE SHALL BE PROVIDED AT LEAST IO CALENDAR DAYS PRIOR TO THE FIRST DAY OF DELIVERY. PLANT MATERIALS SHALL BE DELIVERED TO THE JOB SITE NOT MORE THAN 7 WORKING DAYS PRIOR TO THEIR RESPECTIVE PLANTING DATES.
- B. PROTECTION DURING DELIVERY: PLANT MATERIAL SHALL BE PROTECTED DURING DELIVERY TO PREVENT DESICCATION AND DAMAGE TO THE BRANCHES, TRUNK, ROOT SYSTEM, OR EARTH BALL. BRANCHES SHALL BE PROTECTED BY TYING-IN. EXPOSED BRANCHES SHALL BE COVERED DURING TRANSPORT.
- C. <u>FERTILIZER:</u> FERTILIZER SHALL BE DELIVERED IN MANUFACTURER'S STANDARD SIZED BAGS SHOWING WEIGHT, ANALYSIS, AND MANUFACTURER'S NAME. STORE UNDER A WATERPROOF COVER OR IN A DRY PLACE AS DESIGNATED BY THE OWNER'S REPRESENTATIVE.
- D. INSPECTION: ALL PLANT MATERIALS SHALL BE INSPECTED UPON ARRIVAL AT THE JOB SITE BY THE OWNER'S REPRESENTATIVE FOR CONFORMITY TO TYPE AND QUANTITY WITH REGARD TO THEIR RESPECTIVE SPECIFICATIONS.
- E. MULCH: A MULCH SAMPLE SHALL BE INSPECTED BY THE PROJECT BIOLOGIST OR ECOLOGIST PRIOR TO THE MULCH BEING DELIVERED TO THE SITE.

F. STORAGE:

- I. PLANT MATERIAL NOT INSTALLED ON THE DAY OF ARRIVAL AT THE SITE SHALL BE STORED AND PROTECTED IN DESIGNATED AREAS. PLANTS STORED ON THE PROJECT SITE SHALL BE PROTECTED FROM EXTREME WEATHER CONDITIONS BY INSULATING THE ROOTS, ROOT BALLS OR CONTAINERS WITH SAWDUST, SOIL, COMPOST, BARK OR WOODCHIPS. PLANT MATERIAL SHALL BE PROTECTED FROM DIRECT EXPOSURE TO WIND AND SUN. BARE-ROOT PLANT MATERIAL SHALL BE HEELED-IN. CUTTINGS AND EMERGENT PLANTS MUST BE PROTECTED FROM DRYING AT ALL TIMES AND SHALL BE HEELED-IN WITH MOIST SOIL OR OTHER INSULATING MATERIAL. ALL PLANT MATERIAL STORED ON-SITE SHALL BE WATERED DAILY UNTIL INSTALLED.
- 2. STORAGE OF OTHER MATERIALS SHALL BE IN DESIGNATED AREAS.

- A. PLANTING SEASON: INSTALL WOODY PLANTS BETWEEN OCTOBER I AND FEBRUARY IS WHENEVER THE TEMPERATURE IS ABOVE 32 DEGREES F AND THE SOIL IS IN A WORKABLE CONDITION, UNLESS OTHERWISE APPROVED IN WRITING. CUTTINGS SHALL ONLY BE USED IF PLANTING OCCURS BETWEEN DECEMBER IST AND APRIL IST.
- B. <u>PLANT INSTALLATION:</u> EXCEPT FOR CONTAINER-GROWN PLANT MATERIAL, THE MAXIMUM TIME BETWEEN THE DIGGING AND INSTALLATION OF PLANT MATERIAL SHALL BE 21 DAYS. THE MAXIMUM TIME BETWEEN PLANT INSTALLATION AND MULCH PLACEMENT SHALL BE 72 HOURS.

1.7 WARRANTY

- A. <u>WARRANTY PERIOD:</u> THE CONTRACTOR-PROVIDED WARRANTY SHALL EXTEND FOR A PERIOD OF ONE YEAR FROM THE DATE OF PHYSICAL COMPLETION. PHYSICAL COMPLETION FOR THE WORK OF THIS SECTION IS THE DATE WHEN ALL GRADING, PLANTING, IRRIGATION, AND RELATED WORK HAS BEEN COMPLETED AND IS ACCEPTED BY THE OWNER'S REPRESENTATIVE, THE PROJECT BIOLOGIST OR ECOLOGIST, AND APPLICABLE AGENCIES.
- B. <u>WARRANTY TERMS:</u> CONTRACTOR'S WARRANTY SHALL INCLUDE REPLACEMENT OF PLANTS DUE TO MORTALITY (SAME SIZE AND SPECIES SHOWN ON THE DRAWINGS). PLANTS REPLACED UNDER THIS WARRANTY SHALL BE WARRANTED FOR AN ADDITIONAL YEAR AFTER REPLACEMENT.
- C. EXCEPTIONS: LOSS DUE TO EXCESSIVELY SEVERE CLIMATOLOGICAL CONDITIONS (SUBSTANTIATED BY 10-YEAR RECORDED WEATHER CHARTS), OR CASES OF NEGLECT BY OWNER, OR CASES OF ABUSE/DAMAGE BY OTHERS.

PART 2: PRODUCTS AND MATERIALS

A. GENERAL: ALL PLANT MATERIAL WILL CONFORM TO THE VARIETIES SPECIFIED OR SHOWN IN THE PLANT LIST(S) INDICATED ON THE MITIGATION PLANS AND BE TRUE TO BOTANICAL NAME AS LISTED IN: HITCHCOCK, C.L., AND A. CRONQUIST. 1973. FLORA OF THE PACIFIC NORTHWEST. UNIVERSITY OF WASHINGTON PRESS.

B. <u>SHRUBS AND TREES:</u>

- I. THE PROJECT BIOLOGIST OR ECOLOGIST SHALL EXAMINE PLANT MATERIAL PRIOR TO PLANTING. ANY MATERIAL NOT MEETING THE REQUIRED SPECIFICATIONS SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND REPLACED WITH LIKE MATERIAL THAT MEETS THE REQUIRED STANDARDS. PLANT MATERIAL SHALL MEET THE REQUIREMENTS OF STATE AND FEDERAL LAWS WITH RESPECT TO PLANT DISEASE AND INFESTATIONS. INSPECTION CERTIFICATES, REQUIRED BY LAW, SHALL ACCOMPANY EACH AND EVERY SHIPMENT AND SHALL BE SUBMITTED TO THE PROJECT BIOLOGIST OR ECOLOGIST UPON CONTRACTOR'S RECEIPT OF PLANT MATERIAL.
- 2. PLANT MATERIALS SHALL BE LOCALLY GROWN (WESTERN WASHINGTON, WESTERN OREGON, OR WESTERN BC), HEALTHY, BUSHY, IN VIGOROUS GROWING CONDITION, AND GUARANTEED TO BE TRUE TO SIZE, NAME, AND VARIETY. IF REPLACEMENT OF PLANT MATERIAL IS NECESSARY DUE TO CONSTRUCTION DAMAGE OR PLANT FAILURE WITHIN ONE YEAR OF INSTALLATION, THE SIZES, SPECIES, AND QUANTITIES SHALL BE EQUAL TO SPECIFIED PLANTS, AS INDICATED ON THE PLANS.
- 3. PLANTS SHALL BE NURSERY GROWN, WELL-ROOTED, OF NORMAL GROWTH AND CHARACTER, AND FREE FROM DISEASE OR INFESTATION. THE PROJECT BIOLOGIST OR ECOLOGIST RESERVES THE RIGHT TO REQUIRE REPLACEMENT OR SUBSTITUTION OF ANY PLANTS DEEMED UNSUITABLE.
- 4. TREES SHALL HAVE UNIFORM BRANCHING, SINGLE STRAIGHT TRUNKS (UNLESS SPECIFIED AS MULTI-STEM, MULTI-CANE, OR MULTI-TRUNK), AND AN INTACT AND UNDAMAGED CENTRAL LEADER. CONTAINER STOCK SHALL HAVE BEEN GROWN IN A CONTAINER FOR AT LEAST ONE FULL GROWING SEASON AND SHALL HAVE A WELL DEVELOPED ROOT SYSTEM. PLANT MATERIAL THAT IS ROOT-BOUND OR HAS DAMAGED ROOT ZONES OR BROKEN ROOT BALLS WILL NOT BE ACCEPTED.
- 5. CONIFEROUS TREES SHALL BE NURSERY GROWN, FULL AND BUSHY, WITH UNIFORM BRANCHING AND A NATURAL, NON-SHEARED FORM, ORIGINAL CENTRAL LEADER MUST BE HEALTHY AND UNDAMAGED. MAXIMUM GAP BETWEEN BRANCHING SHALL NOT EXCEED 9 INCHES, AND LENGTH OF TOP LEADER SHALL NOT EXCEED 12 INCHES.
- 6. SHRUBS SHALL HAVE A MINIMUM OF THREE STEMS AND SHALL BE A MINIMUM HEIGHT OF 18
- 7. TREES AND SHRUBS SHALL HAVE DEVELOPED ROOT AND BRANCH SYSTEMS. DO NOT PRUNE BRANCHES BEFORE DELIVERY.
- 8.NATIVE PLANT CUTTINGS SHALL BE GROWN AND COLLECTED IN THE MARITIME PACIFIC NORTHWEST. CUTTINGS SHALL BE OF ONE TO TWO-YEAR-OLD WOOD, ½ INCH DIAMETER MINIMUM. CUTTINGS SHALL BE A MINIMUM OF 4 FEET IN LENGTH WITH 4 LATERAL BUDS EXPOSED ABOVE GROUND AFTER PLANTING. THE TOP OF EACH CUTTING SHALL BE A MINIMUM OF I INCH ABOVE A LEAF BUD, THE BOTTOM CUT 2 INCHES BELOW A BUD. THE BASAL ENDS OF THE CUTTINGS SHALL BE CUT AT A 45 DEGREE ANGLE AND MARKED CLEARLY SO THAT THE ROOTING END IS PLANTED IN THE SOIL. CUTTINGS MUST BE KEPT COVERED AND MOIST DURING STORAGE AND TRANSPORT, AND NO CUTTINGS SHALL BE STORED MORE THAN THREE DAYS FROM DATE OF CUTTING. CUTTINGS SHALL ONLY BE USED IF PLANTING OCCURS BETWEEN DECEMBER IST AND APRIL IST. FOR PLANTING BETWEEN APRIL IST AND DECEMBER IST, CONTAINER PLANTS SHALL BE USED.
- 9. PLANTS SHALL BE FREE OF SPLITS AND CHECKS, BARK ABRASIONS, AND DISFIGURING
- IO. FOR DECIDUOUS PLANTS, BUDS SHALL BE INTACT AND REASONABLY CLOSED AT TIME OF PLANTING, IF DORMANT.
- II. BALLED AND BURLAPPED PLANTS SHALL HOLD A NATURAL BALL. MANUFACTURED ROOT BALLS ARE UNACCEPTABLE
- 12.PLANTS SHALL CONFORM TO SIZES INDICATED ON THE PLANT SCHEDULE. PLANTS MAY BE LARGER THAN THE MINIMUM SIZES SPECIFIED.

C. <u>SEED MIXES:</u>

- I. SEED MIXES SHALL BE PROVIDED AS DESCRIBED IN THE PLANT SCHEDULE.
- D. <u>NOXIOUS SPECIES:</u> ALL PLANT STOCK AND OTHER RE-VEGETATION MATERIALS SHALL BE FREE FROM THE SEED OR OTHER PLANT COMPONENTS OF ANY NOXIOUS OR INVASIVE SPECIES, AS IDENTIFIED BY THE KING COUNTY NOXIOUS WEED CONTROL BOARD.
- E. <u>SUBSTITUTIONS</u>: SUBSTITUTIONS WILL NOT BE PERMITTED WITHOUT A WRITTEN REQUEST AND APPROVAL FROM THE OWNER'S REPRESENTATIVE, THE PROJECT BIOLOGIST OR ECOLOGIST, AND APPLICABLE AGENCIES.

2.2 PLANTING SOIL

- A. TOPSOIL: IF SUITABLE STOCKPILED NATIVE TOPSOIL IS NOT AVAILABLE FOR MITIGATION PLANTINGS, TOPSOIL SHALL BE OBTAINED FROM OUTSIDE SOURCES. STOCKPILED OR IMPORTED TOPSOIL SHALL BE FERTILE, FRIABLE, SANDY LOAM SURFACE SOIL, FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, ROOTS, STUMPS, STONES LARGER THAN I INCH IN ANY DIMENSION, LITTER, OR ANY OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT
- GROWTH. B. <u>ORGANIC CONTENT:</u> IMPORTED TOPSOIL SHALL CONSIST OF ORGANIC MATERIALS AMENDED AS NECESSARY TO PRODUCE A BULK ORGANIC CONTENT OF AT LEAST 10 PERCENT AND NOT GREATER THAN 20 PERCENT, AS DETERMINED BY AASHTO-T-194.
- C. <u>COMPOST:</u> COMPOST SHALL MEET THE DEFINITION FOR COMPOSTED MATERIALS AS DEFINED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

D. <u>SOIL AMENDMENTS (BUFFER AREAS ONLY):</u>

- D.A. FERTILIZER: WOODY PLANTINGS SHALL BE FERTILIZED WITH A SLOW-RELEASE GENERAL GRANULAR FERTILIZER (16-16-16), WITH APPLICATION RATES AS SPECIFIED BY MANUFACTURER. FERTILIZER SHALL BE APPLIED AFTER PLANTING PIT IS BACKFILLED, AND PRIOR TO APPLICATION OF MULCH. FERTILIZER SHALL NOT BE APPLIED BETWEEN NOVEMBER AND MARCH. NO FERTILIZER SHALL BE APPLIED WITHIN WETLAND AREAS.
- D.B. SOIL MOISTURE RETENTION AGENT: A SOIL MOISTURE RETENTION AGENT, SUCH AS "SOILMOIST" OR EQUAL, SHALL BE INCORPORATED INTO THE BACKFILL OF EACH PLANTING PIT, PER MANUFACTURER'S INSTRUCTIONS. NO MOISTURE RETENTION AGENT SHALL BE APPLIED WITHIN WETLAND AREAS.

- A. BARK OR WOODCHIP MULCH SHALL BE DERIVED FROM DOUGLAS FIR, PINE, OR HEMLOCK SPECIES. THE MULCH SHALL NOT CONTAIN RESIN, TANNIN, OR OTHER COMPOUNDS IN QUANTITIES THAT WOULD BE DETRIMENTAL TO ANIMAL, PLANT LIFE, OR WATER QUALITY. SAMDUST SHALL NOT BE USED AS MULCH.
- B. MULCH SHALL BE MEDIUM-COARSE GROUND WITH AN APPROXIMATELY 3-INCH MINUS PARTICLE SIZE. FINE PARTICLES SHALL BE MINIMIZED SO THAT NOT MORE THAN 30%, BY LOOSE VOLUME, WILL PASS THROUGH A US NO. 4 SIEVE.

2.4 MISCELLANEOUS MATERIALS

- A. <u>STAKES, DEADMEN AND GUY STAKES:</u> SOUND, DURABLE, WESTERN RED CEDAR, OR OTHER APPROVED WOOD, FREE OF INSECT OR FUNGUS INFESTATION.
- B. <u>CHAIN-LOCK TREE TIES:</u> 1/2-INCH WIDE, PLASTIC.

PART 3: EXECUTION

3.ISOIL PREPARATION

- A. PLANTING AREA CONDITIONS: CONTRACTOR SHALL VERIFY THAT PLANT INSTALLATION CONDITIONS ARE SUITABLE WITHIN THE PROJECT AREA(S). ANY UNSATISFACTORY CONDITIONS SHALL BE CORRECTED PRIOR TO START OF WORK. WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, POOR DRAINAGE, COMPACTED SOILS, SIGNIFICANT EXISTING OR INVASIVE VEGETATION, OR OTHER OBSTRUCTIONS, CONTRACTOR SHALL NOTIFY THE PROJECT BIOLOGIST OR ECOLOGIST PRIOR TO PLANTING. THE BEGINNING OF WORK BY THE CONTRACTOR CONSTITUTES ACCEPTANCE OF CONDITIONS AS SATISFACTORY.
- B. <u>PLANTING IN GRADED AREAS:</u> IN GRADED PLANTING AREAS PLANTS SHALL BE INSTALLED IN 6-INCHES OF NEWLY PLACED TOPSOIL.
- C. <u>SOIL DECOMPACTION/SCARIFICATION:</u> SOILS IN GRADED/DISTURBED AREAS THAT ARE COMPACTED AND UNSUITABLE FOR PROPER PLANT GROWTH SHALL BE DECOMPACTED AND/OR SCARIFIED TO A MINIMUM DEPTH OF 6-INCHES PRIOR TO TOPSOIL INSTALLATION.

3.2 PLANTING

- A. <u>PLANT LAYOUT:</u> PROPOSED LOCATIONS OF TREES AND SHRUBS SHALL BE STAKED AND IDENTIFIED WITH AN APPROVED CODING SYSTEM OR BY PLACEMENT OF THE ACTUAL PLANT MATERIAL. FOR LARGE GROUPINGS OF A SINGLE SPECIES OF SHRUB, LANDSCAPE CONTRACTOR MAY STAKE THE PLANTING BOUNDARIES.
- B. <u>OBTAIN LAYOUT APPROVAL FROM THE PROJECT BIOLOGIST OR ECOLOGIST PRIOR TO</u> EXCAVATION OF PLANTING PITS.

C. PLANTING PIT DIMENSIONS:

- I. PIT DEPTH: NOT TO EXCEED THE ROOT BALL OR CONTAINER DEPTH.
- 2. PIT WIDTH: MEASURED AT THE GROUND SURFACE, 2 TIMES THE WIDTH OF THE ROOT BALL OR CONTAINER, AS INDICATED IN TYPICAL PLANTING DETAILS.

- I. BALLED PLANTS: SET PLANTS IN POSITION AND BACKFILL 1/2 DEPTH OF BALL. COMPLETELY REMOVE CAGE AND TWINE FROM PLANT AND PULL BURLAP DOWN AS FAR AS POSSIBLE. COMPLETE BACKFILL AND SETTLE WITH WATER. ROOT COLLAR SHALL REMAIN I INCH ABOVE ADJACENT GRADE.
- 2. SHRUB/TREE PLANTING: SHRUB AND TREE STOCK SHALL BE PLANTED IN HAND-DUG HOLES ACCORDING TO PLANTING DETAILS SHOWN ON THE MITIGATION PLANS. SHRUB AND TREE ROOT BALLS SHALL BE SET SO THAT ROOT COLLARS ARE I INCH ABOVE ADJACENT GRADE. ALL BACKFILL SHALL BE GENTLY TAMPED IN PLACE.
- 3. SURFACE FINISH: FORM A SAUCER AS INDICATED ON TYPICAL PLANTING DETAILS, OR AS DIRECTED. GRADE SOIL TO FORM A BASIN ON THE LOWER SIDE OF SLOPE PLANTINGS TO CATCH AND RETAIN WATER.
- 4. ACTUAL PLANT SYMBOL QUANTITIES SHOWN ON THE PLANS SHALL PREVAIL OVER QUANTITIES SHOWN ON THE PLANT SCHEDULE IN THE EVENT OF A DISCREPANCY.

- I. GRADED BUFFER AREAS: ARE MULCHED PRIOR TO PLANT INSTALLATION AS DIRECTED IN
- 2. WATER PLANTS THOROUGHLY AFTER MULCHING F. PRUNING: PRUNE IMMEDIATELY AFTER PLANTING ONLY AS DIRECTED BY THE PROJECT
- G. TREE STAKES AND TIES: STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET OR OVER IN HEIGHT WITH ONE (I) STAKE PER TREE, STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR BALL, IN LINE WITH THE PREVAILING WIND, AND AT A 10 DEGREE ANGLE FROM THE TREE TRUNK. LOOSELY ATTACH STAKE TO TREE

USING CHAIN-LOCK TIES; TREE SHOULD BE ABLE TO SWAY. H. <u>INSTALLING TEMPORARY IRRIGATION</u>

BIOLOGIST OR ECOLOGIST.

- I. <u>GENERAL REQUIREMENTS:</u> CONTRACTOR SHALL PROVIDE AN ABOVE-GROUND TEMPORARY IRRIGATION SYSTEM CAPABLE OF FULL HEAD-TO-HEAD COVERAGE OF ALL PLANTED PROJECT AREAS. THE TEMPORARY IRRIGATION SYSTEM SHALL EITHER UTILIZE CONTROLLER AND POINT OF CONNECTION (POC) FROM THE SITE IRRIGATION SYSTEM OR SHALL INCLUDE A SEPARATE POC AND CONTROLLER WITH A BACKFLOW PREVENTION DEVICE PER WATER JURISDICTION INSPECTION AND APPROVAL. THE SYSTEM SHALL BE ZONED TO PROVIDE OPTIMAL PRESSURE AND UNIFORMITY OF COVERAGE, AS WELL AS SEPARATION BETWEEN AREAS OF FULL SUN AND SHADE AND FOR SLOPES IN EXCESS OF 5 PERCENT. THE SYSTEM SHALL BE OPERATIONAL FOR A MINIMUM OF THE FIRST TWO GROWING SEASONS AFTER PLANTING (THE FIRST TWO YEARS OF THE PERFORMANCE MONITORING PERIOD), OR LONGER IF REQUIRED TO ENSURE PROPER PLANT ESTABLISHMENT. THE SYSTEM SHALL BE REMOVED UPON FINAL APPROVAL OF THE
- 2. SYSTEM DESIGN AND MATERIALS: ELECTRONIC VALVES SHALL BE THE SAME MANUFACTURER AS THOSE USED FOR THE SITE IRRIGATION SYSTEM, OR SHALL BE RAIN BIRD PEB SERIES OR EQUAL IF SYSTEM IS NOT CONTIGUOUS WITH THE SITE SYSTEM. VALVES SHALL BE SIZED TO ACCOMMODATE PRESSURE AND ZONE CONSUMPTION REQUIREMENTS OF THE SYSTEM AND SHALL BE INSTALLED BELOW GRADE IN CARSON (OR EQUAL) VALVE BOXES. WIRING SHALL BE INSULATED MULTI-STRAND, TAPED TO THE MAIN AT 6-INCH INTERVALS WITH DUCT TAPE WRAPS. ON-GRADE MAIN AND LATERAL LINES SHALL BE CLASS 200 PVC BELL PIPE WITH SOLVENT WELDED FITTINGS, SECURED IN-PLACE WITH WIRE STAPLES WHERE NECESSARY ON SLOPED AREAS, LINES SHALL BE PLACED 12 INCHES BELOW GRADE IN 4 INCH PCV SLEEVES WHERE VEHICULAR OR MAINTENANCE ACCESS IS NEEDED ACROSS LINES TO THE PROJECT AREA(S). MAXIMUM MAIN LINE SIZE SHALL BE 11/2 INCHES AND MAY BE LOOPED BACK TO THE POC TO REDUCE PRESSURE LOSS. LATERAL LINES SHALL BE SIZED IN DECREASING DOWNSTREAM ORDER PER RAIN BIRD DESIGN STANDARDS; THE MINIMUM LATERAL SIZE SHALL BE 1/4 INCH. HEADS SHALL BE ROTOR OR IMPACT TYPE INSTALLED 4 FEET ABOVE FINISHED GRADE ON 2-INCH DIAMETER WOOD TREE STAKES. STAKES SHALL BE SECURE IN THE GROUND, EMBEDDED TO A MINIMUM DEPTH OF 24 INCHES. HEADS AND % INCH PVC RISERS SHALL BE SECURED TO STAKES WITH CONSTRICTING HOSE CLAMPS; NO FUNNY PIPE SHALL BE USED. HEADS AND NOZZLES SHALL PROVIDE MATCHED PRECIPITATION RATES FOR EACH ZONE.

MITIGATION PROJECT AT THE END OF THE PERFORMANCE MONITORING PERIOD.

- 3. PROGRAMMING: IRRIGATION SYSTEM SHALL BE PROGRAMMED TO PROVIDE APPROXIMATELY I/2 INCH OF WATER EVERY THREE DAYS DURING THE DRY SEASON (APPROXIMATELY JUNE 15TH TO OCTOBER 15TH). IRRIGATION AMOUNTS IN ZONES LOCATED IN THE SHADE OR ON STEEP SLOPES MAY BE REDUCED IF APPROVED BY THE PROJECT BIOLOGIST OR ECOLOGIST OR THE PROJECT ECOLOGIST/BIOLOGIST.
- 4. WATER AND POWER SUPPLY FOR SYSTEM: THE OWNER SHALL PROVIDE WATER AND ELECTRICITY FOR THE SYSTEM.
- 5. <u>AS-BUILT DRAWING:</u> A CHART DESCRIBING THE LOCATION OF ALL INSTALLED OR OPEN ZONES AND CORRESPONDING CONTROLLER NUMBERS SHALL BE PROVIDED BY THE CONTRACTOR AND PLACED INSIDE THE CONTROLLER AND GIVEN TO THE OWNER'S REPRESENTATIVE.

- 6. WARRANTY: THE IRRIGATION SYSTEM SHALL INCLUDE A ONE-YEAR WARRANTY AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FROM THE DATE OF FINAL PROJECT ACCEPTANCE. THE WARRANTY SHALL INCLUDE SYSTEM ACTIVATION AND WINTERIZATION FOR THE FIRST YEAR AND IMMEDIATE REPAIR OF THE SYSTEM IF IT IS OBSERVED TO BE MALFUNCTIONING.
- J. <u>CRITICAL AREAS FENCE AND SIGNS:</u> INSTALL CRITICAL AREAS FENCE AND CRITICAL AREAS SIGNS WHERE SHOWN ON PLANS.
- K. <u>RESTORE EXISTING NATURAL OR LANDSCAPED AREAS:</u>
- I. EXISTING NATURAL OR LANDSCAPED AREAS THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, UNLESS IMPROVEMENTS OR MODIFICATIONS ARE SPECIFIED FOR THOSE AREAS.
- 2. CONTRACTOR SHALL EXERCISE CARE TO PREVENT INJURY TO THE TRUNK, ROOTS, OR BRANCHES OF ANY TREES OR SHRUBS THAT ARE TO REMAIN. ANY LIVING, WOODY PLANT THAT IS DAMAGED DURING CONSTRUCTION SHALL BE TREATED WITHIN 24 HOURS OF OCCURRENCE, AND THE PROJECT BIOLOGIST OR ECOLOGIST SHALL BE NOTIFIED IMMEDIATELY OF THE INCIDENT. DAMAGE TREATMENT SHALL INCLUDE EVENLY CUTTING BROKEN BRANCHES, BROKEN ROOTS, AND DAMAGED TREE BARK. INJURED PLANTS SHALL BE THOROUGHLY WATERED AND ADDITIONAL MEASURES SHALL BE TAKEN, AS APPROPRIATE, TO AID IN PLANT SURVIVAL
- L. <u>FINAL INSPECTION AND APPROVAL:</u> THE CONTRACTOR SHALL NOTIFY THE PROJECT BIOLOGIST OR ECOLOGIST IN WRITING AT LEAST TEN DAYS PRIOR TO THE REQUESTED DATE OF A PROJECT COMPLETION INSPECTION. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED BY THE PROJECT BIOLOGIST OR ECOLOGIST AND SUBMITTED TO THE CONTRACTOR FOR COMPLETION. AFTER PUNCH LIST ITEMS HAVE BEEN COMPLETED, THE PROJECT BIOLOGIST OR ECOLOGIST SHALL REVIEW THE PROJECT AGAIN FOR FINAL ACCEPTANCE OF PLAN IMPLEMENTATION. IF PUNCH LIST ITEMS REQUIRE PLANT REPLACEMENT, AND THE INSPECTION OCCURS OUTSIDE OF A SUITABLE PLANTING SEASON, PLANTS SHALL BE REPLACED DURING THE NEXT PLANTING SEASON.
- M. <u>AS-BUILT PLAN:</u> CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT LOCATIONS AND QUANTITIES ON THE PLANT SCHEDULE WITH THOSE REPRESENTED AS SYMBOLS ON THE MITIGATION PLANS. CONTRACTOR SHALL KEEP A COMPLETE SET OF PRINTS AT THE JOB SITE DURING CONSTRUCTION FOR THE PURPOSE OF RECORDING IN-THE-FIELD CHANGES OR MODIFICATIONS TO THE APPROVED PLANS. THIS INFORMATION SHALL BE UPDATED ON A DAILY BASIS AS NECESSARY.

PART 4: ONE YEAR CONTRACTOR WARRANTY

- NOTE: THESE MAINTENANCE SPECIFICATIONS APPLY TO THE ONE-YEAR CONTRACTOR WARRANTY PERIOD ONLY. IF THIS MITIGATION PROJECT REQUIRES LONG-TERM PERFORMANCE MONITORING, AS DETERMINED BY THE GOVERNING JURISDICTION, THE MAINTENANCE SPECIFICATIONS AND GUIDELINES ASSOCIATED WITH THE PERFORMANCE MONITORING STANDARDS ARE INCLUDED IN THE MITIGATION REPORT ASSOCIATED WITH THIS PLAN SET, AND MAY ALSO BE INCLUDED ON A SEPARATE PLAN SHEET IF REQUIRED.
- A. REVIEW OF MAINTENANCE REQUIREMENTS: CONTRACTOR SHALL REVIEW LANDSCAPE MAINTENANCE RECOMMENDATIONS WITH A QUALIFIED WETLAND BIOLOGIST FROM THE PROJECT BIOLOGIST OR ECOLOGIST WHO IS FAMILIAR WITH THE STATED GOALS AND OBJECTIVES OF THE PROJECT PLAN.
- B. MAINTENANCE ACTIVITIES: CONTRACTOR SHALL MAINTAIN TREES AND SHRUBS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE IN ORDER TO MAINTAIN HEALTHY GROWTH AND HABITAT DIVERSITY. MAINTENANCE ACTIVITIES SHALL INCLUDE, BUT ARE NOT LIMITED TO: (A) REPLACING PLANTS DUE TO MORTALITY, (B) TIGHTENING AND REPAIRING TREE STAKES, (C) RESETTING PLANTS TO PROPER GRADES AND UPRIGHT POSITIONS, AND (D) CORRECTING DRAINAGE PROBLEMS AS REQUIRED.

- I. <u>SYSTEM MAINTENANCE AND REPAIR:</u> THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACTIVATING, WINTERIZING, MAINTAINING, AND CONTINUALLY VERIFYING THE ADEQUATE OPERATION OF THE TEMPORARY IRRIGATION SYSTEM FOR THE FIRST GROWING SEASON FOLLOWING INSTALLATION. SYSTEM FUNCTION (INCLUDING ELECTRONIC VALVE AND CONTROLLER FUNCTION) SHALL BE INSPECTED FOR OPERATION AND FULL COVERAGE OF ALL PLANTED AREAS DURING EACH MAINTENANCE VISIT. THE SYSTEM SHALL BE REPAIRED IMMEDIATELY IF FOUND TO BE DAMAGED OR MALFUNCTIONING. SYSTEM SHALL BE PROGRAMMED AND MAINTAINED TO PROVIDE APPROXIMATELY 1/2 INCH OF WATER EVERY
- D. <u>STAKE AND TIE REMOVAL:</u> CONTRACTOR SHALL REMOVE TREE STAKES AND TIES ONE YEAR AFTER INSTALLATION, UNLESS RECEIVING WRITTEN PERMISSION FROM THE PROJECT BIOLOGIST OR ECOLOGIST TO DELAY REMOVAL OF STAKES AND TIES
- E. <u>EROSION AND DRAINAGE:</u> CONTRACTOR SHALL CORRECT EROSION AND DRAINAGE
- PROBLEMS AS REQUIRED. F. IRRIGATION SYSTEM REMOVAL: CONTRACTOR SHALL REMOVE IRRIGATION SYSTEM APPROXIMATELY 2 YEARS AFTER PLANTING, OR AS APPROVED BY THE PROJECT BIOLOGIST
- OR ECOLOGIST. G. FINAL MAINTENANCE INSPECTION AND APPROVAL: UPON COMPLETION OF THE ONE-YEAR MAINTENANCE PERIOD, AN INSPECTION BY THE PROJECT BIOLOGIST OR ECOLOGIST SHALL BE CONDUCTED TO CONFIRM THAT THE PROJECT AREA WAS PROPERLY MAINTAINED. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED AND SUBMITTED TO THE CONTRACTOR FOR CORRECTION. UPON CORRECTION OF THE PUNCH LIST ITEMS, THE PROJECT SHALL BE REVIEWED BY THE PROJECT BIOLOGIST OR ECOLOGIST FOR FINAL CLOSEOUT OF
- PLAN IMPLEMENTATION. H. THE CONTRACTOR SHALL PROVIDE MANUAL WATERING TO ALL UNIRRIGATED MITIGATION PLANTINGS BETWEEN JUNE 15TH AND OCTOBER 15TH. SUPPLEMENTAL WATERING MAY ALSO BE REQUIRED IF HOT, DRY WEATHER OCCURS EITHER BEFORE OR AFTER THESE DATES. DURING THE FIRST YEAR AFTER INSTALLATION, PLANTINGS SHALL BE WATERED A MINIMUM OF ONE INCH PER WEEK. WATERING FREQUENCY MAY BE INCREASED AS NECESSARY DURING

PROLONGED PERIODS OF HOT, DRY WEATHER TO PREVENT PLANT MORTALITY.

NOT FOR CONSTRUCTION

THESE PLANS HAVE BEEN SUBMITTED TO THE APPROPRIATE AGENCIES FOR REVIEW AND APPROVAL. UNTIL APPROVED, THESE PLANS ARE:

<u>SUBJECT TO REVISION</u>



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- ENHANCEMENT. 4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN APRIL, 2020.

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HYLA CROSSING PUMPED STORMWATER DISCHARGE

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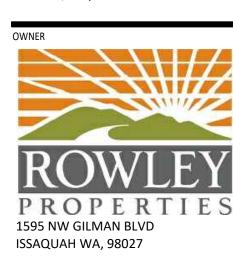
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PROFESSIONAL SEAL

EP, AO, MW PRINCIPAL PROJECT MANAGER PROJECT LANDSCAPE ARCHITECT

MW

DRAWN BY

CHECKED BY AO

ASDP

DRAWING SET DESCRIPTION

REVISIONS No. DATE **DESCRIPTION** 10/03/2019 **30% CD** 4/1/2020 **COI ASDP**

PLANTING SPECIFICATIONS

4/1/2020